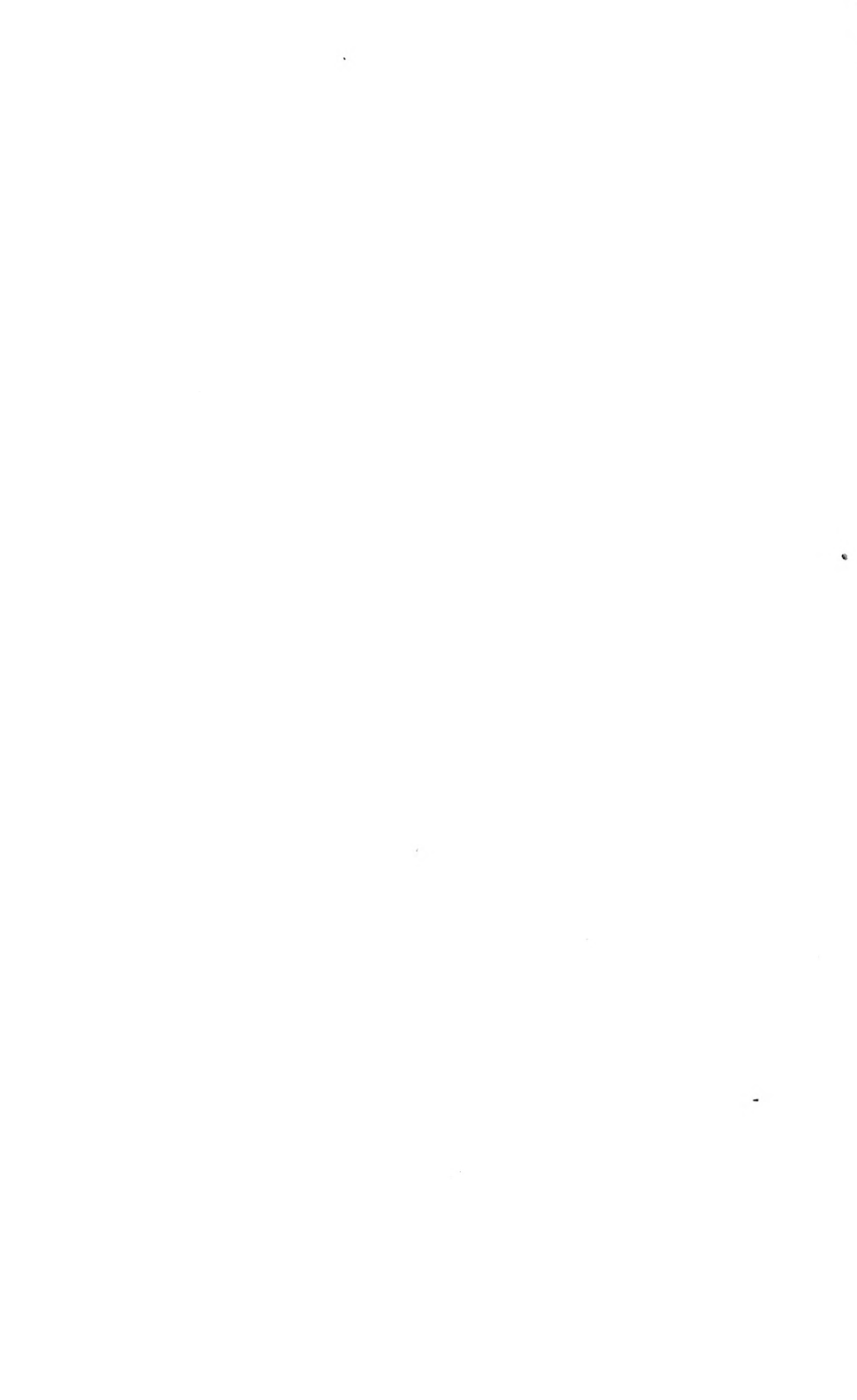




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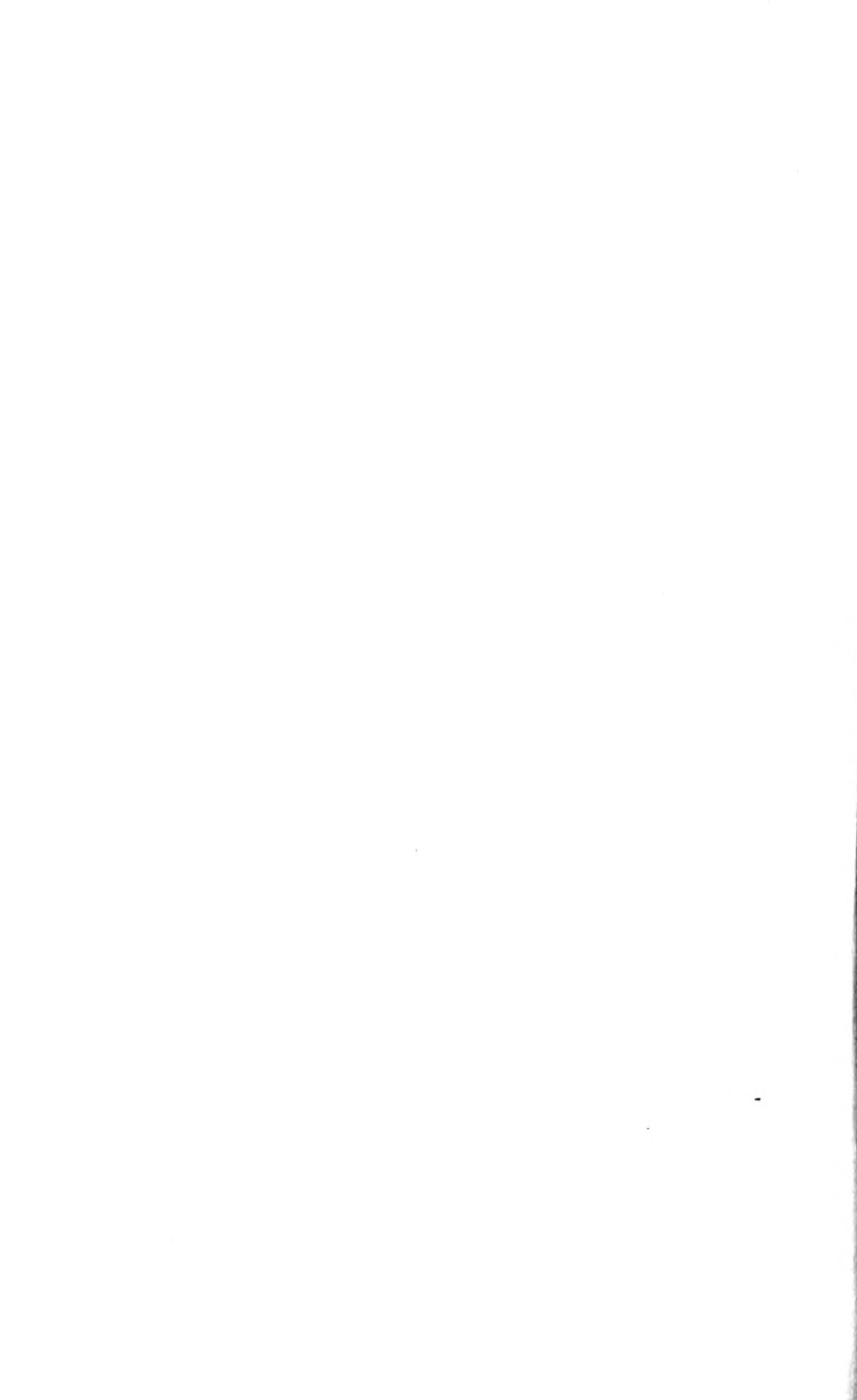


THE
AMERICAN JOURNAL
—OF—
OPHTHALMOLOGY.

VOLUME IV. 1887.



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No. 1.

A CASE OF GLAUCOMA ILLUSTRATED WITH MICRO-
PHOTOGRAPHS.

BY H. CULBERTSON, M. D., ZANESVILLE, O.

ASSISTANT SURGEON U. S. ARMY, RETIRED.

February 12, 1885, Mr. B. P., æt. 74, consulted me for a disease of the right eye, of three years standing. There was entire loss of vision in this eye, and a mature cataract, dilated pupil and enlarged superficial bloodvessels, tension=+2, and severe, and deep-seated pain in it. The left eye was painful, and more so at intervals, and then, vision, at all times impaired, was more defective. This eye presented a posterior polar cataract. I could not make out the details of the fundus in this or the right eye. Believing the right eye was glaucomatous, and the left in a state of sympathetic inflammation, I advised enucleation of the right eye as a measure of safety to the left, which was done the same day, under cocaine. The latter did not prevent the pain, although there was but little bleeding. The conjunctiva was so softened that the fixation forceps would not hold. The eye-ball was placed in Müller's fluid for six weeks, and subsequently bleached in a solution of hydrate of chloral, 20 grains to the ounce of distilled water. It was then frozen and divided

longitudinally from corneal apex to optic nerve, avoiding the latter by cutting about 3 mm. above it. A photograph was taken of one of the hemispheres, and after *the half* containing the optic nerve was cut off transversely to the long axis of the eye, a ground-view micro-photograph was taken of *it* in the fresh state, as in Fig. I. This last segment was divided longitudinally through the optic nerve, its sheaths, the papilla, retina, choroid and sclerotic, and this section also was photographed in the fresh state, and the result is shown in Fig. II. The other undivided

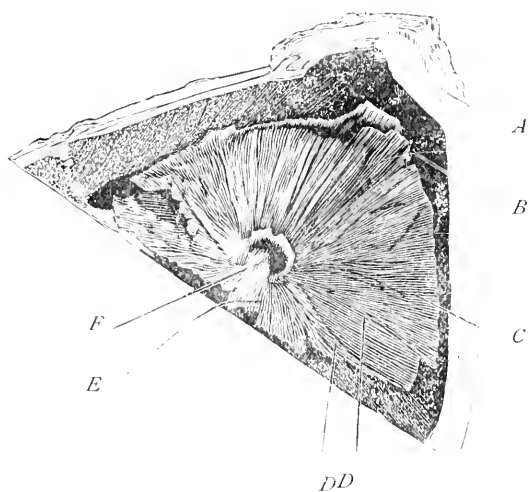


FIG. 1.

A. Sclerotic. B. Choroid. C. Retina. DD. Retinal vessels F. Papilla. E. Nerve fibres.

hemisphere was placed in celloidin until saturated and then allowed to solidify in a 70 per cent solution, in water, of absolute alcohol. It was then mounted in paraffine in a microtome and thin slices obtained at various depths of the hemisphere. Fig. III represents one of these passing through the horizontal diameter of the cornea, lens, sclerotic, etc. These several photographs are about six to eight times magnified.

Referring to Fig. I, the outer circle is the sclerotic; that just within, the choroid, and further in is shown the retina. The optic papilla is seen deformed by exudates, and its margins covering the disk-bloodvessels, which latter further out ramify in an indistinct manner throughout the section of the retina, being almost hidden by inflammatory effusion and proliferation. At the lower border of the retina are seen nerve fibers. A section of the choroid and retina, perpendicular to their plane, shows under the microscope, the choroid, at points, adherent to the retina; that the rods or cones can scarcely be made out, but a few of these, detached and deformed, are seen in the field of the instru-

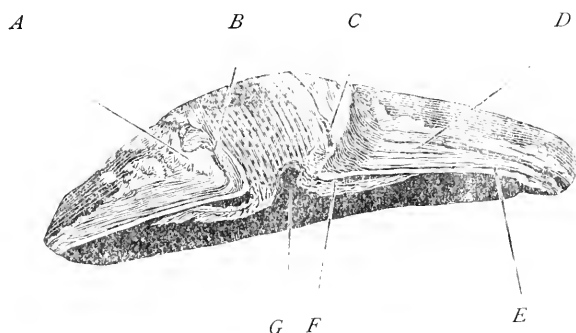


FIG. 2.

A. Arachnoidal sheath and dural sheath. *B.* Pial sheath. *C.* Subarachnoidal space. *D.* Sclerotic. *E.* Choroid. *F.* Retina. *G.* Papilla.

ment. The several layers of the retina cannot be defined, but a number of deformed "granular" and "ganglion" cells may be seen in the field, as well as distorted hexagonal pigment cells, the latter from the choroid. Pigment cells are diffused throughout the retina, and also granular matter. Nerve fibres can be observed indistinctly on the inner side of this section of the retina and fragments of its internal limiting membrane. Occasionally vertical fibers can be observed. The details of the choroid cannot be made out satisfactorily. All these states serve to complete the evidences of inflammation and its sequelæ in these membranes.

FIG. II represents a section of the optic nerve and its sheaths, the papilla, choroid and retina. The dural and arachnoidal sheaths are blended. The pial sheath and the subarachnoidal space of

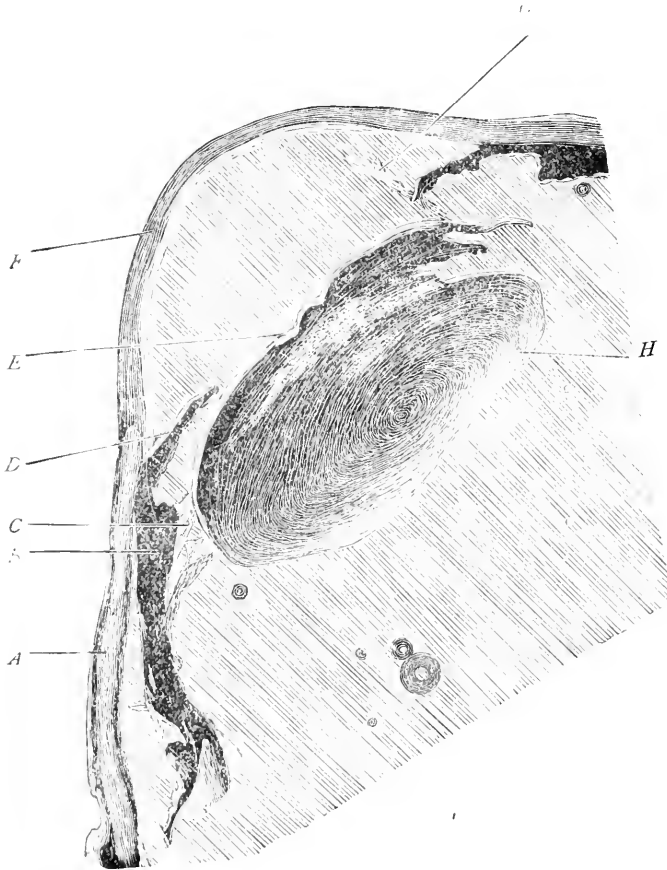


FIG. 3.

A. Sclerotic. *B.* Ciliary body. *C.* Suspensory ligament. *D.* Iris. *E.* Capsule of lens. *F.* Cornea. *G.* Portion of suspensory ligament detached. *H.* Lens.

the optic nerve investments are seen, as well as the optic nerve and its fibers, and also the eribriform fascia faintly; but the central vessels of the optic nerve are not seen. The sclerotic, choroid and retina are seen, and the latter is separated from the choroid anterior to the papilla.

The vitreous body, under the microscope, is shown to be diseased throughout, and at points this instrument was not necessary to detect its lesions. Thus there was seen pigment, granular matter, portions of retinal fibers and of the "internal limiting" membrane of the retina, a few deformed "granular" and "ganglion" cells from the retina, and also blood corpuscles, and patches of blood due to choroidal hæmorrhage.

FIG III represents an anterior section of the eye. The choroid is separated on both sides and along the outer side of each ciliary body up to the region of Schlemm's canal, and a portion of the split choroid remains attached to the sclerotic. The vessels of the choroid are enlarged as well as those of the ciliary body. In the latter, the longitudinal muscle fibres are indistinct, and it is somewhat atrophied owing to cyclitis. On the left side, the portion of the suspensory ligament, attached normally to the outer margin of the posterior capsule, has floated forward between the lens and ciliary body, while the anterior segment of this ligament remains attached to the anterior capsule. Nearly opposite the head of the left ciliary process can be seen, under the microscope, a group of deformed hexagonal cells which have been separated from the choroid, and having floated forward, rest upon the margin of the lens. This, and the fact that on this, as well as on the opposite side of the lens, a part of the posterior capsule has been carried forward, on the right side even into the anterior chamber; and also that the iris is turned forward on each side, and a space is seen between the margin of the lens and the head of the ciliary body, greater than normal, leads to the conclusion that the current, in this eye, at some stage of the disease, was from behind forward. On the right side, the suspensory ligament leading to the posterior capsule at the margin, is separated from the lens, but is attached to the ciliary body, and a portion of the lens at its right margin is split, and the anterior segment is carried with the anterior cap-

sule and turned forward. At the inner extremity of the partially atrophied and irregularly defined iris, rests a portion of the anterior segment of the suspensory ligament, and at the same point is seen the extremity of a portion of the membrane of Descemet, torn off from the cornea and curved backwards, and resting upon the inner pupillary margin of the iris on this side. From near the apex of the cornea towards the left, extending to the outer margin and origin of the iris, the membrane of Descemet is still attached to the internal elastic layer, and the latter is roughened over its entire surface, and contains, as well as the internal elastic membrane, numerous pigment granules and a free deposit of granular matter. The iris is further forward on this than on the left side, and there is an open passage between the right margin of the lens and the adjacent ciliary body, permitting the intra-ocular fluids to pass forward freely on this side.

The anterior capsule of the lens is *in situ*, but thickened and slightly separated from the lens, but the posterior capsule is not in normal position. On the left of the lens is quite a large opening in its structure, and a larger one on its right, which extends to the center of its anterior region. The lens fibres can be made out. Throughout the lens substance, can be seen a quite free deposit of pigment granules. The anterior chamber is large and the pupil widely dilated, and at the base of the iris, its outer surface rests against the cornea. On the outside, towards the apex, the cornea is disintegrated, involving the epithelial and elastic layer, and the true cornea at points; and the entire external surface of this membrane is irregular and shows delicate ridges. The fibers of the true cornea are wavy instead of running parallel with the surfaces of the cornea, and often they are broken. At several points this layer is disintegrated. The canal of Schlemm is closed on both sides.

Just where the disease began in this eye is questionable; but the evidences of papillitis, retinitis, choroiditis, hyalitis, cyclitis, capsulitis, iritis, keratitis, disintegration of the lens, rupture of the suspensory ligaments and closing of the outlets of the eye, and resulting glaucoma, are apparent.

DESCRIPTION OF AN AMETROPIA MODEL FOR CLASS-DEMONSTRATION.

By GEO. M. GOULD,

OF PHILADELPHIA, PA.

THE OBJECT OF THE MODEL is to give teachers of physiology and ophthalmology ready and striking illustrations before their classes of the principles of emmetropia, hyperopia, myopia, astigmatism, (all varieties), presbyopia, the interval of Sturm, etc.

THE ESSENTIAL FEATURE OF THE MODEL is the illustration by four cords of the course of four typical and correspondent rays of light traversing an emmetropic or ametropic eye. These cords are so devised that they always remain taut whatever their displacement on the cross-bars, representing the rectilinear propagation of light. The cords are large in order to be easily distinguished from a distance, the two horizontal ones covered with blue silk, and the two vertical with scarlet, thus more clearly representing their courses.

THE LUMINOUS OBJECT, whence proceed the light-rays is placed in front of the nodal point of the refractive system of the eye and is represented by cross-bars placed as far from the nodal point in front as the emmetropic focus, (the retina at zero) is behind the same. The attachments of the cords to the cross-bars are such that, sliding in grooves, by a movement of the hand the cords can be made to diverge from a point, proceed in a parallel manner, or enter the eye convergent.

THE FOCUS OF THE RAYS, after these have passed the cornea and lens is at the fovea in the center of a segment of the posterior pole of the globe; the last is mounted on a stand movable by a screw with rack and pinion attachment. Through slots in the retina the rays pass on to the cross-bars behind, like

those in front; by slipping the cord-attachments along the grooves of the cross-bars the rays can be made to converge in

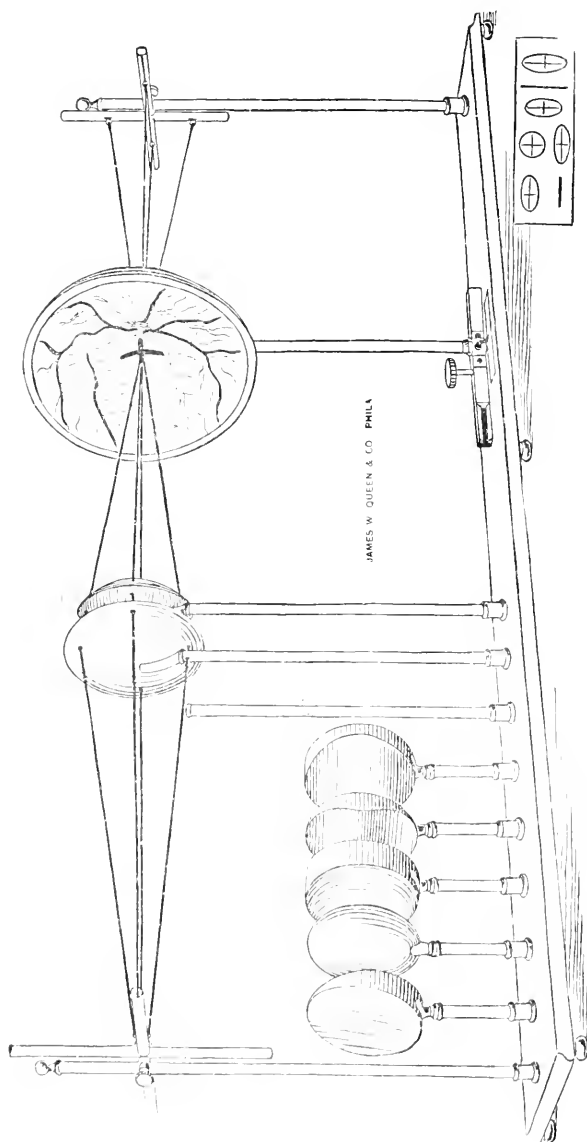


FIG. 4.

front of or behind the retina, or irregularly so, by which the conditions of hyperopia, myopia, or astigmatism are demonstrated at a glance. As by the screw the retina may at pleasure be placed at these varying foci, the illustration is thus rendered all the more convincing. This movement of the retina representing 15 dioptries, either of hyperopia or myopia is shown by the pointer upon the brass-plate at the base of the retinal stand.

ASTIGMATISM of all kinds is represented by the varying focalization of the vertical and the horizontal rays, and to make the explanation still more striking, disks of the representative astigmatic retinal images are added to the outfit.

MODELS OF LARGE CORRECTING LENSES consisting of representative convex and concave sphericals, convex and concave cylinders, and a prism, accompany the model. A stand for these is placed so that they may be mounted in front of the cornea like a spectacle-lens, or held by the handle in the hand either of teacher or student, during demonstration. A model of an astigmatic cornea is also added.

| | <i>The Normal Eye.</i> | <i>The Model.</i> |
|--|----------------------------|-------------------|
| One dioptry of hyperopia is equivalent to an axial shortening of | mm. .31 | mm. 6.2 |
| Five dioptries | 1.50 | 30.0 |
| Ten " | 2.78 | 55.6 |
| Fifteen " | 3.91 | 78.2 |
| One dioptry of myopia to an axial lengthening of . | .32 | 6.4 |
| Five dioptries " " " " " . | 1.74 | 34.8 |
| Ten " " " " " " . | 3.80 | 76.0 |
| Fifteen " " " " " " . | 6.28 | 125.6 |

THE MODEL REPRESENTS THE RIGHT EYE, and the retina has the bowl-like shape of the posterior one-third of the eyeball. The nasal side is presented to the class. The entrance of the

optic nerve, the papilla, macula, and the ramifications of the *vasa centralia* are pictured upon the concave surface.

THE DIMENSIONS OF THE MODEL are twenty times those given of the normal eye by Graefe and Saemisch.

The model has been examined by Dr. L. Webster Fox and Prof. A. P. Brubaker, experienced teachers of ophthalmology and of physiology and pronounced by them as calculated to be of great service to teachers in giving rapid and brilliant illustrations of the principles of the refraction of the eye. The model is manufactured, and correspondence concerning it will be answered by

JAS. W. QUEEN & CO.,
924 Chestnut St., Philadelphia.

A CASE OF SYMPATHETIC OPHTHALMIA THIRTY-FIVE YEARS AFTER THE INJURY—RECOVERY BY ENUCLEATION.

BY F. CORNWALL, M. D., SAN FRANCISCO, CAL.

The *pathogeny* of sympathetic ophthalmia has been a subject of so much discussion, and accurate clinical knowledge is of so much importance in helping to establish facts regarding it, that this case is deemed of sufficient importance to publish. The interesting points in the case are that it was a case of optic neuritis, and that it was evidently caused, after so long a lapse of time since the reception of the traumatism of the injured eye, by the bone-tissue in it, which irritated the optic nerve as a foreign body; the transmission in this case extending through the nerve of one eye to that of its fellow.

The history of the case is as follows:

Mr. H., a fruit grower, aged 48, presented himself with the following history and symptoms: He stated that about thirty-five years ago, while picking cherries, he fell from a tree several feet, lighting on an upturned hoe, cut his upper lid and eye-ball almost in two. The country doctor who attended him directed that a poultice be tied over the wound, and so it healed, the two cut edges of the upper lid adhering to the stump. The injured eye gave no trouble up to within a few days previous to his application to me, except that there had always been a slight tenderness at the point of adhesion between the lid and eyeball.

As previously intimated, about ten days before his application to me, he became aware that his only eye was going blind. Periods of a few hours would occur, wherein there would be a heavy cloud before him and then his vision was very imperfect. The *spells* would be more marked each day, and when he presented his vision was R. E. blind. L. E. $\frac{20}{c}$.

There was more or less pain in the sympathizing eye, but none to speak of in the stump. There was also orbital pain. My examination with the ophthalmoscope revealed distinct optic neuritis, the disk being so red and swollen that it was with difficulty the outline between it and the retina could be discerned. There was also slight haziness of the vitreous. The pupil was dilated, and the movements of the iris sluggish.

I at once enucleated the right. Upon examination of the stump there was nothing to attract one's attention, as regards a cause for the inflammation in the well eye, except that ossification had taken place, forming a complete tunic, and to its peculiar formation I attributed the trouble. The bony shell formed an opening around the optic nerve entrance, and on one side a sharp spicula of bone passed against or into the structure of the nerve. Two days after the operation vision rose to $20 \frac{20}{x}$, and the pain had almost subsided.

At the present writing, over six months have elapsed and the eye has entirely recovered. The disk remained hyperæmic for two or three months, but has now become normal in its appearance.

It is my opinion that this was a case of sympathetic optic neuritis, and that the inflammation of the nerve in the sympathizing eye was caused by irritation of the nerve of the traumatized one by the sharp edges of bone. This would go to prove that the medium through which irritation is transmitted from an affected eye to its healthy fellow depends much, and may be altogether, upon the site of the original injury. From my experience with phthisical eyeballs in which ossification has taken place, I am led to the belief that this bony structure is oftener the cause of sympathetic disease than is commonly thought. The fitting of artificial eyes upon old stumps of this kind often produces irritation of the other eye, and this, I have reason to believe, most likely occurs where there is ossification.

AFTER-TREATMENT OF CATARACT OPERATIONS.

DR. S. C. AYRES, CINCINNATI.

We seem to be passing through a period of evolution in the matter of the treatment of cataract patients immediately after operation, if we may judge from the number of articles appearing in the journals on that subject. The old method of close bandaging and enforced quiet for several days is justly falling into disuse. The rigid rules once in vogue are now broken, much to the comfort of the patients who, as a rule, bear the recumbent position badly. Patients used to complain more of pain in their backs than in their eyes, and would beg to be released from confinement to the bed. I long ago learned that it was very important to comply with these reasonable requests for change of position, and would allow patients to turn on either side, or to be propped up in bed with a rest behind their backs to support them. I am more liberal now, and allow patients to be up and be dressed the second or third day after operation. It certainly seems reasonable that we should endeavor to make our patients as comfortable as possible as a first and essential condition to success.

It seems quite certain that the old-fashioned figure of 8 bandage has been productive of bad results from the restless movements of the patients. If the head should be moved from side to side, and especially if the patient should slide down in the bed, that portion of the bandage which goes behind the occiput would be drawn upon, and thus both directly and indirectly traction would be made upon the eyeball. To obviate this, I used a single strip of bandage around the head, having first covered both eyes with a piece of soft muslin or linen and placed a small quantity of absorbent cotton over each eye. This was objectionable, as it would sometimes slip off at night leaving the eyes exposed. I have for some time past adopted the following very simple and comfortable

method of dressing an eye after cataract operation. A piece of absorbent cotton large enough to fill the "hollow" of the eye, even with the rim of the frontal bone and the bridge of the nose, is placed over the closed eyelids. Over this is placed a flap cut from soft muslin or linen about two inches broad, and long enough to extend from the forehead to the lower edge of the malar bone. It may be single or double. This is held in position by a narrow strip of isinglass plaster across the forehead. The cotton absorbs any secretions from the eye and is changed twice a day. By lifting the flap and removing the cotton the condition of the lids can be inspected without any inconvenience to the patient. He does not have to lift his head to allow the bandage to be removed or readjusted. He can turn his head on the pillow at night as much as he pleases without fear of making traction on the eyeball. It is simple, comfortable and free from the dangers of the bandage, and affords the eye ample protection. I prefer to cover only the operated eye, but give strict instructions to the patient to keep both eyes closed until he is permitted to open them. I have within the past two months, among others, operated on two persons, one aged 80, and the other 82, who were treated in this way. They sat up in bed as much as they wanted to the day after the operation. They did not care to be dressed until the third day. The light in the room was modified by partly closing the shutters. They were in the hospital only six days, and went home with good results.

ON SOME OF THE OPTICAL PROPERTIES OF SPHERICAL AND CYLINDRICAL LENSES PLACED OBLIQUELY TO THE INCIDENT PENCILS OF LIGHT.

SWAN M. BURNETT, M. D., WASHINGTON, D. C.

In general text-books on optics, where the ordinary properties of optical apparatus are treated of, it is assumed that the surfaces are of limited amplitude and that the object lies on the optical axis. Otherwise it would be impossible to get general formulæ approaching to the simplicity of those now in use in determining the formation of images by reflection and refraction. And for the vast majority of uses to which optical apparatus are put, this is sufficient.

It is, however, of more than a mere scientific interest to know something of the behavior of lenses when placed obliquely to the path of the light-pencils, and where they are of the amplitude of lenses ordinarily used for spectacles.

This has been done theoretically in some of the more extensive treatises on higher optics, but, so far as I know, no experimental demonstration of the phenomena has been made with lenses in common use, except that by Pickering and Williams.¹

These authors give tables showing the foci of lenses for every 5° when turned on their vertical axis, both for their vertical and horizontal meridians. They show that the refraction is increased by such inclination for both meridians, but much more rapidly for the horizontal. In other words, the rotation of a spherical lens increases its refraction and at the same time adds to it a cylindrical action—the lens becomes a spherocylinder.

Their experiments were made by observing through a small

¹ Foci of lenses placed obliquely by Prof. E. C. Pickering and Dr. Chas. H. Williams. *Proc. Amer. Acad. of Arts and Sciences*, N. S. Vol. II. 1874-75. pp. 300-307.

telescope and the lens experimented with two fine silken threads stretched in narrow slits, and placed horizontally and vertically before a gas-flame. The silken threads could be seen distinctly only when they were in the focus of the lens, and a graduated scale on which the screen holding the threads moved, showed the points at which they were then distinctly seen at each successive rotation of 5° .

The observations were made through a small aperture and the center of the lens.

While engaged recently, in investigating some other point in refraction, I also experimented with obliquely placed lenses, but in a somewhat different manner.

I used in my experiments a Snellen's phakometer, and observed the images of the small holes in the disk which serve as the source of light; as they were cast on the ground-glass screen. The disk and the screen are always at conjugate foci, and the exact focus of the lens experimented with can be read on the horizontal bar on which they move for every position of the screen. The lens was placed at equal distance from the screen and disk, and so arranged as to turn on its vertical axis, which passed through the center of a horizontal semi-circle marked at every five degrees.

The results I obtained were, in the main, the same as those of Pickering and Williams, but there were some additional phenomena not mentioned by them to which I would here call attention.

When the lens lay at right-angles to the course of the rays, the round dots of light were clearly and sharply defined when the screen was at the focus of the lens.

If, now, the lens was rotated for, say, 10° , the dots were no longer clearly outlined as round points, but became elongated *horizontally*. If the screen was then advanced toward the lens, the form of the images changed and they finally became, in a certain position of the screen, elongated *vertically*.

This, of course, showed an increased refraction in the planes parallel to the horizontal meridian of the lens, brought about by a rotation of the lens on its axis. This increase in refrac-

tion for this meridian was found to be greater, the greater the inclination of the lens, as judged by the nearer and nearer position of the screen required in order to have the vertical lines with sharp edges. It was also observed that as the lens was more and more inclined, the screen had to be approached nearer and nearer the lens in order to have the horizontal lines with sharp edges.

All this is what was to be expected from the investigations of Pickering and Williams.

It was observed, in addition, however, that the vertical lines corresponding to the holes in the horizontal meridian near the periphery of the disk, were not sharply outlined at the same position of the screen. As the screen was approached to the lens, the line to the *right*, (the image of the hole to the *left* of the disk) and corresponding to the side of the lens farthest from the screen was the first to become sharply defined. The lines at the center and to the left of the screen became distinct only when the screen was brought still closer to the lens, and then the line to the right was thrown out of focus.

This shows conclusively that *the focal plane of an obliquely placed lens is not at right-angles to the optical axis, but inclined, and the inclination is in a direction opposite to the inclination of the lens.*

In table I. is given the refraction of a lens of 1 D. for an inclination of every five degrees up to 45° . Beyond this the dispersion of light was so great as to make accurate focussing impossible for the horizontal planes.

TABLE I.

| INCLINATION OF LENS. | SPHERICAL REFRACTION | f | f' |
|----------------------|----------------------|---------|---------|
| 5° | slight | slight. | slight. |
| 10° | 1.1 | 1.6 | 1.25 |
| 15° | 1.2 | 1.1 | 1.5 |
| 20° | 1.25 | 1.57 | 1.75 |
| 25° | 1.39 | 1.7 | 2.2 |
| 30° | 1.4 | 2.1 | 3. |
| 35° | 1.5 | 3.1 | 4. |
| 40° | 1.6 | 3.1 | 5.1 |
| 45° | 1.75 | 5.2 | 6.8 |

The first column shows the inclination of the lens in degrees; the second the focus of the horizontal lines, representing the

spherical refraction; f the focus of the extreme right vertical line; f' the focus of the extreme left vertical line. The refraction is noted in dioptries and decimals.

The experiments were repeated with a large number of lenses from the trial-case. The same general principles lying at the basis of all, it is unnecessary to give them in detail, but it is interesting to note, as would be expected, that the difference in the foci of the two sides became more noticeable as the lenses were stronger. In table II. are given the foci for a lens of 8 D. to the right (f) center (f_0) and left (f_1) of the screen.

TABLE II.

| INCLINATION OF LENS. | SPHERICAL REFRACTION | f | f_0 | f_1 |
|----------------------|----------------------|------|-------|-------|
| 10° | 8.1 | 8.3 | 8.4 | 8.5 |
| 20° | 8.2 | 8.7 | 9. | 9.5 |
| 30° | 8.5 | 10 | 10.5 | 11.3 |
| 40° | 9 | 13.5 | 15. | 17. |

It should be mentioned that these foci make no pretensions to an accuracy within a tenth of a dioptre, and in the greater inclinations hardly that could be claimed, on account of the large number of diffusive images and general indistinctness of the lines.

It was further observed that the horizontal lines, produced by refraction in the vertical planes of the lens, did not become equally distinct throughout their entire length at a fixed position of the screen. The end to the right, corresponding to the more distant side of the lens, and the left side of the disk, become clearly outlined before the other.

These observations were verified in a number of ways. If, for example, when the 1 D. was rotated at an angle of 30° and the right vertical line was in focus (f) $a-0.5$ was held close before the lens the left line was brought out clearly, and the right became blurred. When it was at 40° and the screen was in the position of f , $a-1.5$ brought out the left vertical line (f_1) distinctly, and blurred f ; and when it was at f_1 , $a+1.5$ blurred that line and made f clear.

Verification by neutralization was also made when test-types were obscured through obliquely placed lenses. This was not

so satisfactory with the weaker lenses and slighter inclinations, but was quite plain for the stronger lenses and greater inclinations. When $+4$ D., for example, is rotated to 30° , a single line of Snellen's test-types cannot be seen distinctly throughout its entire length, when -4 . and any one cylinder is placed close behind the lens.

The letters to the left of the line come out clearly with -0.75^{cy} the center with -1.5^{cy} and those to the right with -1.75^{cy} axes vertical. With no one of these cylinders alone can the whole of the line be seen with equal clearness when the observing eye is on the optical axis.

The general truth of the proposition can also be verified by a simple experiment with an ordinary magnifying lens. If a lens of one or two inches focus is held obliquely before a printed word, it will be observed that when the letters at one end of the word are in focus and seen clearly, those at the other end are indistinct.

It has been, for a long time, a matter of observation by some, that in certain cases, particularly after cataract-extractions, a better optical effect was obtained by tilting the spectacle lens than could be had by any combination of spherical and cylindrical lenses. The facts brought out in these experiments will, I believe, help to explain this clinical observation which has not hitherto been very clearly understood.

It has been determined by keratometric measurements¹ that after extraction of cataract the form of the cornea is very much altered, and even after cicatrization has taken place, there remains a certain, and in some cases a very large, amount of regular astigmatism that can be corrected by cylinders. But in addition to this, there sometimes remains as a result of cicatrization an unequal curvature in the vertical meridian. This meridian no longer represents the segment of a circle, whose center is common with that of the other meridians, but a curve either with varying radii or with a center off the optical axis. Either one of these conditions would produce a focal plane for that meridian lying obliquely to the optical

axis, which could be neutralized by a lens inclined at the proper angle. And it is hardly claiming too much to assert that now having a means in our hands in the ophthalmometer of Javal and Schiötz by which we can measure the refraction at different points of the same meridian, we may be able to discover the exact inclination of a given lens which is necessary to neutralize this irregular astigmatism, and have it permanently mounted; or, a formula might be obtained for grinding a lens having the optical equivalent of such a tilted lens. The use of such a lens has already been proposed by Dr. O. Purtscher, in *Knapf's Archives* XV. p. 264. 1886.

Experiments were also made with

OBLIQUELY PLACED CYLINDERS

and with exactly the same results as regards the refracting meridian as with spherical lenses; that is there was an inclination of the focal plane and the figures for f , $f\phi$ and f_1 , were the same as for sphericals of the same number.

Dr. G. Hay, of Boston, was the first, I believe; to call attention to the increase in the power of a cylinder by a rotation on its axis.² This fact was called in question by Sous,³ who contends and claims to demonstrate that the focus of a rotated cylinder is lengthened

My experiments confirm fully the statements of Hay, and we are forced to conclude that Sous has constructed his formula on incorrect data.

The problem is not so simple as Sous seems to think it, and for lenses of large aperture requires a long and tedious discussion, and those who wish to enter more fully into the mathematics involved, I would refer them to Pickering and Williams' paper, (l. c.)

¹ See among others, papers by Laqueur *Graefé's Archiv* XXX, 1 pp. 99-134, and myself, *Knapf's Archives*, Vol. XIV. pp. 169-176.

² Trans. Amer. Oph. Soc. 1875. p. 319.

³ Traité d'optique, by G. Sous. Paris, 1881. p. 463.

A FURTHER REPORT OF EXTRACTIONS OF SENILE CATARACT.

BY A. R. BAKER, M. D., CLEVELAND, OHIO.

In the January number, 1885, of the AMERICAN JOURNAL OF OPHTHALMOLOGY, I reported twenty-seven consecutive cases of senile cataract extraction. This report includes all my extractions since the previous report ending November 1, 1885.

My method of operation is briefly to wash out the conjunctival sack with a 1-5000 bichloride solution. A narrow Von Graefe knife is entered in the sclerotic one line from the cornea and two or three lines above the centre of the pupil. The point of the knife is passed to the centre of the pupil, the direction is then changed and the counter puncture made opposite the point of entrance. I endeavor to bring the knife out at the corneo-scleral margin and make a small conjunctival flap. I make a large iridectomy so as to leave the pupil key hole-shaped. I make the peripheral opening in the capsule recommended by Knapp, and leave the capsule as nearly intact as possible. The speculum is then removed and the lense is delivered by making slight pressure on the upper lid with the finger and on the lower lid with the scoop. I never touch the cornea with any instrument. I am always particular to have the incision perfectly cleansed, but am not particular about removing all the cortical substance from the eye if enclosed in the capsule where it can do no harm and is soon absorbed, I instill a drop of a 4% solution of atropia, apply a small adhesive plaster to the lids, cover with a piece of linen removed from a bichloride of mercury solution, pack with absorbent cotton, and apply a fourtailed (Moorfields) bandage. Put the patient to bed, keep him quiet and comfortable, but give him the privilege of sitting up or changing to whatever position is to

him most agreeable. If there is no pain, uneasiness, rise of temperature or other indication of trouble, I do not disturb the dressings until the morning of the third or fourth day, when I remove them, instill a drop of atropia and reapply the bandage. This is then done daily until the end of a week or ten days when a broad shade is substituted.

Cocaine was used as an anæsthetic in all cases except No. 30.

| No. | Sex. | Age. | Eye Operated.* | Duration Since Mature. | Remarks. |
|-----|------|------|----------------|-----------------------------------|---|
| 28 | M. | 65 | L.* R. | One year. Immature. | Severe iritis occlusion of pupil. Perception of light good. Six months afterward made iridotomy. V. $\frac{20}{30}$. |
| 29 | F. | 80 | L.* R. | Four years. One year. | Severe iritis. Old case of granular lids. Occlusion of pupil. After second or third attempt secured a fair pupil. V. $\frac{20}{30}$. |
| 30 | M. | 74 | L.* R. | One year. Immature. | V. $\frac{20}{20}$. |
| 31 | M. | 79 | L. R.* | One year. One year. | Health poor. V. $\frac{20}{70}$. |
| 32 | F. | 62 | L.* R. | Two years. Four years. | Slight iritis. V. $\frac{20}{70}$. |
| 33 | F. | 74 | L. R.* | Three years. One year. | V. $\frac{20}{30}$. |
| 34 | M. | 79 | L.* R. | One year. One year. | Severe iritis. Occlusion of pupil. Behaved very much like case 29. After several ineffectual attempts I was able to secure a fair pupil. V. $\frac{20}{200}$ not very satisfactory. |
| 35 | F. | 97 | L. R.* | 10 years. 10 years. | V. $\frac{20}{70}$. Health good considering age. |
| 36 | F. | 40 | L.* R. | ? No cataract forming. | V. $\frac{20}{20}$. |
| 37 | M. | 60 | L. R.* | Immature. Two years. | V. $\frac{20}{30}$. |
| 38 | M. | 65 | L. R.* | Three years. Four years. | V. $\frac{20}{20}$. |
| 39 | F. | 50 | L.* R. | Two months. Three years. | V. $\frac{20}{30}$. Slight iritis. |
| 40 | M. | 62 | L. R.* | Immature. Two months. | V. $\frac{20}{50}$. Slight iritis |
| 41 | M. | 72 | L.* R. | One month. Removed when a boy. | V. $\frac{20}{30}$. |
| 42 | M. | 60 | L. R.* | Immature. Three months | V. $\frac{20}{70}$. |

| No. | Sex. | Age. | Eye Operated.* | Duration Since Operation. | Remarks. |
|-----|------|------|----------------|------------------------------|---|
| 43 | M. | 78 | L. R.* | Two years. | This is same gentleman as case 11 of previous report. His vision in left eye remained very good but is troubled with bodies floating in vitreous. V. R. eye $\frac{20}{30}$. |
| 44 | M. | 46 | L. R.* | Immature. Two years. | V. $\frac{20}{70}$. Slight iritis. |
| 45 | F. | 55 | L. R.* | One year. Two years. | V. $\frac{20}{40}$. |
| 46 | M. | 70 | L.* R. | Five years. Three years. | Panophthalmitis. V.=0. |
| 47 | M. | 42 | R.* L. | One year. Immature. | V. $\frac{20}{40}$. |
| 48 | F. | 80 | R.* L. | Two years. Four years. | V. $\frac{20}{30}$. |
| 49 | M. | 74 | L. R.* | One year. Four years. | V. $\frac{20}{30}$. |
| 50 | F. | 90 | R.* L. | Three years. Three years. | V. $\frac{20}{10}$. |

Nine of the above cases were females and 14 males. The right eye was operated in 14 cases and the left in 9. When corrected with lenses from one to three months after operation.

| | | | | | |
|---|--|---|---|---|------------------|
| 3 | of the above cases could read (Snellen | - | - | - | $\frac{20}{20}$ |
| 7 | " " " " " " | - | - | - | $\frac{20}{30}$ |
| 3 | " " " " " " | - | - | - | $\frac{20}{40}$ |
| 1 | " " " " " " | - | - | - | $\frac{20}{50}$ |
| 5 | " " " " " " | - | - | - | $\frac{20}{70}$ |
| 1 | " " " " " " | - | - | - | 0 |
| 3 | occlusion of pupil, after operation. | | | | |
| 1 | could read (Snellen) | - | - | - | $\frac{20}{30}$ |
| 1 | " " " " " " | - | - | - | $\frac{20}{100}$ |
| 1 | " " " " " " | - | - | - | $\frac{20}{200}$ |

The result of the operation in this series of cases has not been as satisfactory as in the cases reported previously. I have attributed most of the ill results to the use of cocaine as an anæsthetic. No. 27 of the previous report was the first case operated with cocaine. Results satisfactory. The second case operated with cocaine was the first of this series, No. 28. Severe iritis, attributed to the use of cocaine. The third case, No. 29, severe iritis. These two cases made me somewhat afraid of cocaine and I operated the next case, No. 30, without an anæsthetic with good results. My unfortunate experience in these two cases I attributed to the use of a large quantity of the drug. In the balance of my operations I used only one or two drops of a freshly prepared solution. This small amount has answered all practical purposes, and the results were quite satisfactory in all the cases excepting Nos. 34 and 46. No. 34, a feeble, nervous old man, very much afraid of the operation, a bad heart, or I should have given ether. It took a very large amount of cocaine to produce anæsthesia and even then the old man complained of considerable pain. Severe iritis. No. 46, an excellent case, operated at Charity Hospital. After making every preparation for the operation I found I had forgotten my cocaine, and used a solution already prepared in the hospital. This is the only case in which there was any corneal complication, and I attributed the loss of the eye to the use of the old solution of cocaine. From my present experience with cocaine in cataract extractions I would say that, when used with proper precautions, it is better than any general anæsthetic. But with a patient easily managed the results are better when no anæsthetic is used, and in the future I shall confine its use to those cases in which formerly I should have resorted to a general anæsthetic.

Many of these cases, as in the previous report, were operated at their homes and left under the care of the family physician, and the results of the operation in seven or eight cases operated in general hospitals were not as satisfactory as those operated at home, even when the surroundings were far from being good. I am still more impressed with the truth of Dr.

Lawson's remark "that the success of cataract extractions depends upon the operation itself and not on the after treatment."

I was criticised quite severely by some of my colleagues for taking this ground in my last report, and it was with considerable pleasure I have noticed the growing sentiment of letting the patient have more freedom after cataract extractions, although I fear Dr. Chisolm and others have gone to the other extreme. A light bandage certainly excludes a portion of the light, prevents motion, is grateful to the patient, can do no harm and is in accordance with the best surgical principles.

The fifty cases may be arranged as follows according to age, including the visual result of those cases subsequent to operation for securing an artificial pupil.

| <i>Age.</i> | <i>No.</i> | <i>VISUAL RESULTS.</i> | | | | | | | 0 |
|-------------|------------|------------------------|-------|-------|-------|-------|--------|--------|---|
| | | 20/20 | 20/30 | 20/40 | 20/50 | 20/60 | 20/100 | 20/200 | |
| 45-50 | 6 | 2 | 2 | 1 | | 1 | | | |
| 50-60 | 10 | 4 | 2 | 1 | 1 | 2 | | | |
| 60-70 | 12 | 4 | 4 | 1 | 1 | 2 | | | |
| 70-80 | 14 | 1 | 5 | 2 | 1 | 3 | | 1 | 1 |
| 80-90 | 6 | | 1 | | | 3 | 2 | | |
| 90-100 | 2 | | 1 | | | 1 | | | |
| | 50 | 11 | 14 | 6 | 3 | 12 | 2 | 1 | 1 |

EDITORIAL NOTICE.

THE INTERNATIONAL CONGRESS.

The ill-health of Dr. Williams, of Cincinnati, having compelled him to resign his presidentship of the Ophthalmological Section, Dr. J. J. Chisolm, of Baltimore, has been appointed to that place, the editor of this journal accepting the secretaryship.

As the guests have been invited, and are coming in spite of all strife and dissensions, it seems clearly our duty to do all we can in this section as well as in all the others, to make the sessions as interesting as we can possibly do. We hereby appeal to the American oculists to help in this endeavor by preparing papers for the occasion.

Those having something of value to bring before the section, and who have decided or shall decide to do so, should send an abstract of their paper *at once* to Dr. Chisolm (55 Franklin Str., Baltimore, Md.).

Our foreign readers would greatly oblige us by letting us know the names of our ophthalmological colleagues who intend to take part in the Congress, and by sending also the abstracts of their papers as soon as possible to the above named address.

PUBLISHER'S NOTICE.

The publishers of this journal find that, in view of its character and the expense incurred for illustrations and in publishing it, they are obliged to make a slight advance in its price. The latter will henceforth be \$3.00, instead of \$2.50, beginning with the present volume (Vol. IV.) They sincerely hope that the journal has proven of sufficient value to its subscribers to make them feel that it is worth \$.300.

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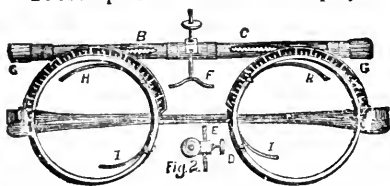
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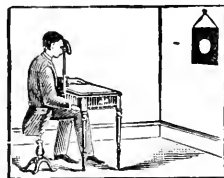
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THE AMERICAN JOURNAL OF
OPHTHALMOLOGY.

VOL. IV.

FEBRUARY, 1887.

No. 2.

A CASE OF SYMPATHETIC NEURO-RETINITIS.

BY S. C. AYRES, M. D., CINCINNATI.

ANATOMICAL EXAMINATION OF THE ENUCLE-
ATED EYE.

BY ADOLF ALT, M. D., ST. LOUIS.

W. W. B., 30, medium size, fair complexion, blue eye, not robust; farmer. Was first examined Jan. 27, 1887. He gave the following history: Two months ago, while chopping wood, a piece flew off and struck his left eye. Sight was lost at once. The eye was bandaged and cold applications were made. The wound healed promptly and he suffered but little pain from it. The wound extends from near the upper border of the cornea directly downward through the diameter of the cornea and fully 2''' into the sclera, cutting entirely through the ciliary body. Iris had prolapsed into wound in its entire length, and had become incarcerated. Corneal wound smooth. The Sclera white, no pain or irritation. V=shadows. The right eye has been sensitive to light ever since the accident, but he could see well

and could read until about ten days ago. At that time he had a bright luminous appearance before the eye, and since then vision has been very imperfect. Sclera white Tn. $V=0.3$. Pupil dilated ad max. by mydriatic. There is a circle of pigment points on the lens capsule, showing that he had had slight iritis. Optic disk is markedly swollen and the vessels are obscured at the periphery by exudation. The central portion of the disk appears very vascular, probably from engorgement of the capillaries. The tortuosity of the vessels extends far out into the retina. The ophthalmoscopic picture of neuro-retinitis is complete in every particular. While this condition presumably exists in every case of sympathetic inflammation, it is very seldom the good fortune of observers to see it in consequence of the turbidity of the media.

I decided not to enucleate the injured eye at once, but to subject him to some preliminary treatment. Four leeches were at once applied to the eye, and he was ordered hydrarg. by inunction. Four days later, December 31st, $V=0.4$. Inunction and rest continued. February 4, $V=0.7$. On this day I enucleated the injured eye. The ball was normal in size. Tn. Vitreus liquefied with the exception of a small portion adhering to the ciliary body. Retina not detached, but in situ. The optic disk presented a swollen appearance similar to that of the right eye. Exudations covered the vessels at the periphery of the disk.

He remained at the hospital until February 14, when he returned home. Vision at that time slightly better than 0.7, but not quite 0.8. He could read Sn. 2 at 10". He had occasional flashes of light in the eye, but his vision remained good all the time.

ANATOMICAL EXAMINATION.

When the eyeball reached me it was cut through the equator into an anterior and a posterior half.

The posterior half showed a well-marked protuberance of the optic papilla. The vitreous body was almost totally removed.

The anterior half showed a rectangular scar in the cornea, the longer portion of which passed almost through the center of this membrane and ended in the corneo-scleral region where the ciliary body was also injured. To this scar in the cornea the iris was glued by an interposed tissue to which the remains of the vitreous body also adhered. The crystalline lens was gone.

The points of interest in this eye are, of course, the optic papilla, the optic nerve, and its surroundings, of which I made a series of sections, of which some were stained with hæmatoxyline-eosine, some with carmine and picric-acid, while a large number were stained with aniline colors according to the methods of Weigert and Gram in order to study the bacterial side of the question.

The optic papilla showed even macroscopically a considerable swelling, and some folds were visible on the outer surface of the retina near the papilla, just as we find them in neuro-retinitis albuminurica. The intervaginal space seemed somewhat wider than usual. The piece of the optic nerve, measured from the level of the choroid (when hardened), was $8\frac{1}{2}$ mm. long. The funnel-shaped line marking the change from medullated into non-medullated nerve-fibres, as I have described it elsewhere, was plainly that of a hypermetropic eye (antero-posterior axis 22 mm.).

Microscopically the swelling of the optic papilla was found to be due to hyperæmia of the blood-vessels, especially the smaller ones, to emigrated and newly-formed cells, and an œdematous condition of the whole nerve-fibre tissue. The round cells are arranged around the blood-vessels in such a manner as to form a perfect sheath around them, many leucocytes are found in the act of emigration. Furthermore, each trabecule of connective tissue is well marked by a large number of round cells lying within it. The physiological excavation of the papilla is very small; the tissue near it and the connective tissue meniscus (Kuhnt) are especially infiltrated with round cells.

The connective tissue trabecules are easily traced backwards

through the lamina cribrosa into the optic nerve by the large quantity of round cells contained within them. The nerve fibres seem to be simply compressed. The small blood vessels are here also hyperæmic, but neither they nor the central retinal artery and vein are accompanied by a very marked quantity of emigrated leucocytes. Within the substance of the optic nerve the round cells seem to lie almost exclusively within the connective tissue. The lymphatic space accompanying the central retinal vessels which, according to Gifford's experiments, I had thought I should probably find filled with round cells, contained none to speak of.

The inter-vaginal space contains nothing. The dura mater-sheath seems to be unaltered as well as the orbital tissue adhering to it. In the pia mater sheath, however, no blood-vessel is visible, that is not surrounded by a large quantity of leucocytes. In consequence this sheath is somewhat broader than it is in the normal condition.

The retina, for about the distance of half the diameter of the optic papilla, is considerably swollen, the swelling gradually tapering off towards the periphery. There is little blood in its blood-vessels, but each and every one of them is surrounded by several layers of round cells, this condition being even more marked here than it is in the tissue of the papilla itself. On its outer surface the retina shows some folds, or rather indentations in such a manner, that on both sides of a portion of about normal thickness and arrangement of the layers, this arrangement is changed by a considerable stretching of the outer molecular and fibrous (Henle) layer. Thus this layer appears to consist chiefly of fibres running at right angles to the surfaces of the retina interspersed with a few round cells. This arrangement is, as stated above, very similar to the condition we find in albuminuric neuro-retinitis. The whole of the optic papilla is broader than normal and the folds in the retina appear as being caused by the fact, that this membrane was pushed towards its periphery.

The whole of the choroid is thicker than normal. Its blood-vessels are partially filled with blood, partially empty. Some

show sclerosis and hyaline degeneration of the walls. The swelling of the tissue is not uniform, in some portions there are nodular prominences. This increase in thickness is due to the infiltration of the whole of the tissue of the choroid with round cells. Where the nodular swellings are seen, these round cells are more numerous, closer packed together, and appear almost like tubercles, or microscopical abscesses. In some places the choroid is firmly adherent to the sclerotic, no interposed new-formed tissue being visible, however. The stellated pigmented cells are partially destroyed.

The sclerotic also contains a great many round cells. They are found especially, however, in its inner layers, and surround each and every blood-vessel, that can be seen within it. This latter condition is in striking contrast with that of the ciliary nerves, which appear in no way altered, and are accompanied by very few round cells, except where they are lying close to a blood-vessel.

In the anterior part of the eyeball the portion of especial interest was that of the scar. Yet, it did not show anything especially remarkable. The scar-tissue and its surroundings are very vascular and here, as in all the other tissues of the eyeball, the blood-vessels are surrounded by a large number of emigrated leucocytes. The pupillary edge of the iris is glued to the scar in the cornea by means of an interposed new-formed tissue. The tissue of the iris contains numerous round cells, and some of its blood-vessels are covered with leucocytes, but, strange to say, the process of inflammation, or at least infiltration, is here less vigorous than in the choroid.

Where the remains of the vitreous body are attached to this new-formed tissue, they contain small accumulations of round cells here and there.

Where the sclerotic and the ciliary body had been injured, they are firmly glued together by a very dense scar-tissue. The iris-angle is obliterated. From the processus ciliares a cyclitic membrane is spreading inward, which contains remnants of a recent hæmorrhage. The sclerotic in this neighborhood is very vascular, and the blood-vessels are all surrounded by a

thick layer of emigrated leucocytes. The condition of the ciliary body is very similar to that of the iris. The infiltration with round cells is somewhat more general than it is in the iris, but less than in the choroid. The blood-vessels, especially in the inner portion, of the ciliary body are surrounded by round cells, and here and there a tubercle-like, dense aggregation of round cells is found. Similar accumulations of round cells are seen within the remnants of the vitreous body, which adhere to the ciliary body, but are otherwise seemingly normal.

The result of the staining of a great many sections by the methods of Weigert and Gram, with almost a fervent wish of being able to detect micro-organisms, was absolutely nil. Patient and careful searching by myself and others was equally unsuccessful.

When, by the kindness of Dr. Ayres, this eyeball was offered to me for microscopical examination, I had the hope that, from the clinical history of the case, it might prove to be especially valuable in eliciting several points. If here we had, as I expected, an injured eye suffering from neuro-retinitis solely, and having produced a sympathetic neuro-retinitis in the fellow, the transmission of the disease from one eye to the other by way of the optic nerve, was all but proven,—if any constitutional or other cause for the double neuro-retinitis could be excluded. This would have been the more probable, since the secondarily affected eye recovered after the enucleation of the first affected, injured eye. If it was further on possible to trace the presence of micro-organisms in the whole or part of the tissues of the injured eye, especially in the optic nerve, its sheaths or the inter-vaginal space, the theory of Leber and Deutschmann, that sympathetic ophthalmia was a septic disease, would have gained considerably in probability. No easier and more plausible explanation of this vexatious affection could be given, it seems to me: yet, one stumbling block, even if the bacterial origin of the disease was proven beyond a doubt, has always remained in my mind, and that is, why should the removal of the injured eye have any, and es-

pecially a curative, effect on the secondarily affected eye. If the second eye is affected on account of bacteria having wandered into it, by whatever route, how can the removal of the eye in which they were first lodged, change their pathogenic action in the second eye?

Yet the eye under consideration failed to clear up the two points which I had hoped it would throw a clear light on. It shows not only a well-marked neuro-retinitis, but all its structures without exception are inflamed. The inflammatory process is much more vigorous and prominent in the posterior portion of the eyeball than in the anterior injured one. With regard to the bacterial origin of the disease, my examination proves, as stated, negative, my being not able to find any micro-organisms anywhere.

The histological conditions of this eye are, however, valuable in some other respects. The neuro-retinitis in this eye was undoubtedly much more violent than is usually the case, according to my own experience, in eyes suffering from an inflammation of the whole of the uveal tract, and approaches closely to what we see in albuminuric neuro-retinitis. The inflammatory process in the nerve itself is confined to the connective tissue and it is most marked in the pia mater sheath of the nerve. The intra-vaginal space shows nothing pathological, and the inflammatory symptoms in the dura mater sheath amount to almost nothing. These conditions, which are so striking that a mistake seems impossible, go, I think, a good way towards proving the conclusions of Knies, made from the examination of the case of serous iritis, and which I have so far not been able to concur in, namely: "That the sympathetic inflammation travels from one eye to the other *along the optic nerve and its pia mater sheath* by way of the chiasma."

This fact seems just at present to be the more important, since but very recently H. Gifford has published a paper in the *Archives of Ophthalmology* (September, 1886), in which he described a new theory of the transmission of the disease from one eye to the other, based on experiments made by infecting one eye with the bacillus anthracis. In a previous paper on

the direction of the lymph-streams in the eye (June, 1886), he had summed up with the following conclusions, which are important in this connection:

1. There is a decided current flowing *from the vitreous out through the central canal*. This does not empty into the intervaginal space, but leaves the nerve and passes into the cranial cavity along the orbital vessels.

2. The current in the intervaginal space flows *from the brain towards the eye*, as shown by Quincke (confirmed by Deutschmann.) This current passes *not into the nerve nor papilla*, but into the suprachoroidal space, and with the posterior vitreous stream, into the orbit. It is not improbable that there is also a certain amount of passage directly through the dural sheath, but the clefts are too fine to permit the ready passage of pigment granules or bacilli.

3. In the nerve itself the current is, in the transverse channels, towards the choroid and intervaginal space, in the longitudinal channels, towards the brain, at least for some millimetres back of the eyeball.

The new theory of transmission, above referred to, given by the same author, is given in the following sentences concluding his paper (September, 1886):

"Granting that sympathetic ophthalmia is an infectious disease, I am far from supposing that the foregoing settles the path taken by the micro-organisms in man. I merely assert that in rabbits the most direct and open path from one eye to the other, and that taken by the anthrax bacilli, lies not in the substance of the nerves themselves, nor in their sheaths, but leaves the first optic nerve with the vessels, passes through the orbit into the cranial cavity and thence via the subvaginal to the suprachoroidal space of the second eye. That the same course may be followed in man is certainly worth taking into consideration."

How do the conditions in the eye under consideration agree with these experimental experiences? In so far very badly, that it was impossible to find any micro-organisms. Moreover, the histological signs of inflammation, the emigration of

leucocytes from the blood-vessels and the infiltration of the surrounding portions of the tissues of the optic nerve are most striking near the physiological excavation, where the nerve fibres pass the choroid in front of the lamina cribrosa, and in the pia mater sheath. The main central retinal blood-vessels within the central canal of the optic nerve and their surroundings show hardly any evidence of emigration. If, therefore, in spite of my failure to find any micro-organisms in this eye, sympathetic ophthalmia is a septic disease, this would go to prove, that either the lymph-stream is not the same in man as it is in cats and rabbits, or that not all micro organisms travel by means of the lymph-streams along the blood-vessels. It is, however, as already stated, a confirmation of the views of Knies, that the inflammatory process travels along the pia mater sheath of the optic nerve.

It is noteworthy that in the eye under consideration neither the nerve-tissue proper of the optic nerve, nor of the ciliary nerves showed any marked histological changes, and that the inflammatory process seems all over to be confined to the blood-vessels and the connective tissue.

If sympathetic inflammation travels from one eye to the other by means of a *materia peccans*, it seems hardly possible that it could travel by any other way than by the nerve substance or its pia mater sheath, and Gifford's explanation, why the septic material having entered the cranial cavity (probably through the sphenoid fissure), should not produce any marked brain symptoms, while it will be able to destroy the fellow-eye, does not seem to me to be very satisfactory. He thinks it is due to the fact that no accumulation of micro-organisms takes place in the cranial cavity sufficiently large to do any mischief, while it will take place in the intervaginal and suprachoroidal space of the fellow-eye, where the micro-organisms are continually thrown by the lymph-stream. This would be, I think, much more plausible, if the micro-organisms travelled along in the pia mater sheath or within the substance of the nerve itself.

There is, however, one more point worthy of mention in this case, which might, perhaps, be considered apt to support an-

other statement made by Gifford. He says: 'As the fungi are carried down from the cranium between the sheaths of the first as well as the second eye, the former is subjected to a double infection, but as it is generally pretty thoroughly disorganized by the primary inflammation; this is generally of little importance.'

As stated above, the inflammatory symptoms in the eye under consideration were considerably more vigorous in the posterior than in the anterior portions of the eyeball, in such a manner, that the inflammation seemed to increase the nearer the optic nerve entrance, and was of a high degree in the nerve itself. Yet in this connection I will state, that optic neuritis may often be found almost as an immediate result of an injury to the eye and at a time when this second infection could as yet not possibly have taken place.

CYST OF THE IRIS.

BY JOHN CHASE, M. D., DENVER, COL.

On September 20, 1886, Mrs. F., a stenographer, æt. 38, consulted me for a trouble of the left eye. She gave the following history: When four years old, a fork was run into her eye by a playmate; the eye was sore for a few days, and then seemed to recover completely. Up to two years ago she has always been able to read for a few moments at a time. Until 1878 she never had sufficient trouble with her eye to consult a physician. She remembers that the pupil was "cat eye" shape. In January, 1878, it began paining her, growing worse very rapidly, and through sympathetic action affecting the sound eye. In the latter part of the same month she consulted Dr. Knapp, who advised immediate operation to save the fellow eye. The patient does not know what operation Dr. Knapp performed, but says that her eye improved so that in a few weeks she resumed work, and had no further trouble with the injured eye until 1884, six years after the operation. She was told while in New York, that a subsequent operation might be necessary. In 1884 she was working in Iowa, and her eye again paining her, she consulted some local oculist. At this time her vision was ($\frac{20}{15}$) in the injured eye, and ($\frac{20}{xx}$) in the sound eye. She submitted to an operation at this time, but cannot tell what it was. She says, however, that she had no further pain until the middle of last summer, shortly before coming to me.

When I first saw her the eyes were in the following condition:

The right eye, normal in every respect; she was having pain in the left eye, and over the left orbit. After working for a few moments, the pain in the left eye would always increase. The lens was cataractous; the iris presented the appearance of

having had two iridectomies, one directly downward, the other at an angle of forty-five degrees upward and inward. There was no cicatrix of the cornea. On the inner segment of the iris between the iridectomies, there was a small cyst, about the size of a kernel of wheat. The tension of the eye was normal. I postponed operating for a time, in order to watch the progress of the cyst. The patient consulted me about September 28, and there had been no perceptible change in the cyst. I did not see her again for about a week, and at that time the cyst had increased three-fold. Tension of the eye was $+1$, and she was unable to use the eyes for work. The right eye at this time was also affected slightly, through sympathy. I advised immediate operation, and the day following, on October 7, I removed the cyst, and the entire segment of the iris, which had been left between the two previous iridectomies. A corneal incision was made with a Graefe's cataract knife. The cyst extended to the periphery, and of course, the entire portion of the iris had to be removed. The operation was made under cocaine. The straining of the patient when the iris was seized, caused the loss of a small portion of vitreus, the corneal tissue was soft, and offered very little resistance to the knife. The iris also tore very easily, and great care was needed to secure every portion of the cyst. The operation was followed by some hæmorrhage; all debris was removed and the eye bandaged after the usual manner. The patient was ordered to remain in bed for two days in a partially darkened room and the eye dressed twice a day. The corneal wound was well closed at the end of the second day, except a small portion of a line in extent: this did not become permanently closed for ten days, but effectually recovered under the use of boracic acid. Up to the present time, three months after the operation, there has been no return of the cyst and the patient has been able to resume work.

ON DIPHTHERIA OF THE CONJUNCTIVA.

BY ADOLF ALT, M. D.

Diphtheritic conjunctivitis or diphtheria of the conjunctiva, being a comparatively rare disease on this continent, it may, perhaps, be welcome to our readers to have a synopsis of a small number of cases which I have had the occasion to see and treat in a six years private practice in this city. I have seen a few more cases in hospital and dispensary practice, but have no record of them.

The cases I can report are the following:

CASE I.—K. G., 10 months old. When first seen the child had had sore eyes for about a week, but the left eye had become very considerably swollen and could not be opened for two days. I found a blennorrhœal discharge from the right eye with moderate swelling of the lids and conjunctiva. The left eye was swollen to a much higher degree, and, as usual, the upper lid more especially. On attempting to turn this lid, I found it impossible. The patient crying out, at every touch of it, I put her under chloroform, but even then I could just see that the inner surface of this lid was covered with a thick grayish-yellow membrane. There was hardly any discharge there. The cornea was slightly hazy, on the lower lid there was an immoveable patch of the same exudation toward the nasal side. The diagnosis being diphtheritic conjunctivitis, I ordered iced compresses and instillations of atropia. Three days later the exuded material began to get loosened at the edges; but only on the fifth day could I turn the upper lid and remove most of the membrane. Considerable hæmorrhage followed, but stopped upon the application of nitrate of silver. I now applied this remedy daily and in the course of two weeks the healing took place, with a small leucoma of the cornea in its upper outer aspect. There was no diphtheria in the neighborhood at the

time, nor did the child have diphtheria of any other mucous membrane.

CASE II.—T. St., 14 months old. The history of this case is almost identical with that of Case No. I. The process lasted three weeks, but the eyes escaped serious injury; only a small leucoma of the right cornea remained behind. There was no diphtheria in the neighborhood at the time, and the child had no diphtheria of any other mucous membrane. The diphtheritic conjunctivitis concerned both eyes and especially the upper lids.

CASE III.—L. St., two and a half years old, sister of Case II, was noticed to have swollen eyes five days after her brother. Only a small patch of exudation was found on the right, and two on the left conjunctiva of the lower lids. In this case I began at once to treat the lids with nitrate of silver, and in two days the exudation came off, leaving small ulcers behind, and in four more days they healed. Two more children of the same family had a slight attack of catarrhal conjunctivitis at the same time.

CASE IV.—J. F., eighteen months old, was brought to see me three days after an enormous swelling of the right eye had occurred. There was a slight muco-purulent discharge from this eye. The upper lid was dark, red and hard, and it was impossible to evert it properly, yet sufficiently so, to see the characteristic exudation on the conjunctiva. I saw this child only once more. It was taken with diphtheria of the throat and died a few days after. This child came from a neighborhood in which a number of cases of diphtheria occurred at the time.

CASE V.—VI.—To these two cases I was called in consultation by the physician, who had treated the children on account of diphtheria of the throat with very considerable gangrene and suppuration of lymphatic glands. The day before calling me, the doctor had noticed a soreness of the eyes with swelling and grayish exudation of the conjunctivæ. He had at once applied a one per cent. solution of nitrate of silver and ordered cold compresses. I saw the children early next morning.

L. E. two years old, had the characteristic exudation on the conjunctival surface of all the four lids and both the corneæ were sloughed and the irides were bare.

A. E., five years old, had also the characteristic exudation covering the conjunctival surfaces of all the four lids. The cornea of the right eye was partially sloughed, that of the left eye was perfectly clear. The general condition of this child was such, that death was continually expected, while the totally blind one was apparently more likely to recover.

Warm applications and instillations of atropia dissolved in a four per cent. solution of boracic acid were employed. The children both gradually recovered from the disease. The one was blind, the other had at least one perfectly good eye. The exudation was beginning to disappear from the conjunctivæ four days after it had been first noticed.

CASE VII.—M. S., thirty years old, worked in a chemical factory and was employed making bromide of ammonium. To this he attributed his eye trouble. He had had red eyes for about a week, when, four days before I saw him, the right eye had become very much swollen and painful to the touch. I found the whole of the conjunctiva of the upper and the lower lids changed into a thick, whitish, yellow membrane, somewhat loose at the edges and easily bleeding there. The whole of the cornea was steamy. Ice, cocaine and atropine afforded some comfort; but when three days after the diphtheritic exudation began to be cast off, the cornea also was broken through and most of it sloughed off during the following days.

Although I had cautioned the patient to protect his left eye from infection as far as possible, I noticed swelling and chemosis of this eye, five days after I had first seen him. On turning the upper lid a patch of diphtheritic exudation was found in the middle portion of it. I at once treated this eye with nitrate of silver and continued ice applications and had a four per cent. solution of boracic acid instilled. The diphtheritic exudation did not extend much farther, yet several points of infiltration appeared in the cornea, near the corneo-scleral margin and upward, which after a few days formed small ulcers,

but healed gently. It took, however, three weeks before the swelling and discharge were perfectly gone. The right eye was then shrunken.

CASE VIII.—E. K., four years old, apparently in excellent health, was operated by me upon her left eye by tenotomy for convergent strabismus on October 2, 1886. The same night she was taken with fever and delirium, the next day there was considerable swelling of the lids and chemosis of the conjunctiva of this eye. The site of the wound looked grayish infiltrated. I at once had a four per cent. solution of boracic acid instilled every few minutes and iced compresses applied. The next day the swelling was worse, and there was a characteristic diphtheritic exudation occupying the site of the wound and its neighborhood. The child was very tenderly cared for by day and night, and finally on the fourth day the diphtheritic membrane came away leaving an ulcer behind, which, however healed rapidly and without serious consequences.

CASE IX.—T. S., æt. fifteen months, was brought to my office on account of an enormous swelling of the right upper lid, which had made its appearance the day before with febrile symptoms. He came from a neighborhood in which diphtheria was raging at the time and had had a sore throat some weeks previously, although this was not of a noticeably diphtheritic character, according to the statement of his physician.

I found the upper lid of the right eye enormously swollen, elongated over the lower lid and purplish red. There was a scanty discharge along the free edge. The merest touch of the lid caused the child to scream. After having tried in vain several times to evert the lid, I finally succeeded and I found the inner surface of this lid a yellowish white mass which was immoveable. The cornea I could not see. I ordered cold compresses and instillations of a solution of the bichloride of mercury of $\frac{1}{2500}$ every half hour, and a solution of atropia and cocaine in a 4% solution of boracic acid to be instilled every three hours.

To my astonishment, the membrane began to dissolve the

next morning, and the second day after having instituted this treatment, the whole of the membrane was gone, leaving a swollen conjunctiva behind, which bled freely and was denuded of its epithelium and suppurating. The swelling and pain were so great that it was not until the next day that I could get a good view of the cornea. It was hazy throughout in its superficial layers. The same treatment was kept up, gradually lessening the applications and instillations. The lid affection healed gently; but the infiltration of the cornea was perfectly gone only on the twelfth day, after I had seen the child first. He is now perfectly well, and has an absolutely clear cornea.

REMARKS.

In the first volume of his Archives of Ophthalmology, von Graefe gave one of his masterly descriptions of the diphtheritic conjunctivitis, of which he then had treated 48 cases. To the description of the appearance of this affection nothing can be added. In speaking of the nature of the disease, von Graefe gave the following as his opinion:

1. Diphtheria is *not* a local disease; it is, on the contrary, a systemic disease, and in this way it differs from blenorrhœa.

2. Its main causes are of an epidemic character.

3. With regard to the predisposition according to age, we may state genuine diphtheria is never found in the newly born.

* * * Genuine diphtheria is observed in rare cases (1 out of 48) towards the end of the first year; it is considerably more frequent (4 among 48) in the first half of the second year. It is most frequently found in the second half of the second and during the third year (23 out of 48). Then it gradually disappears (12 cases from the third to the eighth year) and only 8 cases were seen after the eighth year, and these only at the height of an epidemic.

4. The conjunctival diphtheria is decidedly contagious, and it is so from its first moment of appearance until all secretion has ceased.

With regard to the prognosis, he calls it by far the most dangerous ophthalmia; and he further says that the prognosis

is even worse in the adult than it is in children. In support of this view he gives the following figures: Of 40 children 9 died; in 3 an adherent leucoma was the result; in 21 no corneal complication occurred; in the remaining 7 the corneal affection was of little importance. Of 8 adults, 3 lost the cornea by sloughing; in 2 the cornea was perforated and iridectomy had to be performed later on; the remaining 3 also had affections of the cornea, but in the later stages of the disease, and which were apparently of little importance.

He further states that the earlier the cornea becomes affected, the worse it is.

These experiences of von Graefe, made more than thirty years ago, have not in any material way been corrected by the more modern observers.

Hirschberg distinguishes between three forms of conjunctival diphtheria, viz.:

1. Circumscribed partial diphtheria, where we find a few separate islets of a yellowish-white hue in the diffusely-swollen and stiff mucous membrane, no matter whether they lie in the tarsal or in the intermarginal portion, or in the fornix. They are, however, usually found near the lid-margin.

2. Confluent diphtheria, where these islets are larger and coalesce, thus forming irregular plaques which occupy a considerable portion of the conjunctiva ($\frac{1}{4}$ to $\frac{1}{3}$), yet are more prominently found in the fornix. In this form the swelling and stiffness of the conjunctiva, even of the portions which appear red, are considerably increased.

3. Diffuse diphtheria in which the whole or almost the whole of the conjunctival sac is infiltrated whitish yellow, and the swelling and all other symptoms are of the most pronounced kind.

Saemisch distinguishes simply between a partial and a total diphtheria of the conjunctiva.

Most authors speak of the stage of diphtheritic exudation as the first; of the stage of purulent discharge as the second, and of the stage of scar-formation, as the third one.

Saemisch states that the disease is not only found as an epidemic, but also as a sporadic one.

It is, furthermore, well established that the disease is more frequent in certain countries, and even in certain portions of these, than in others. Northern Germany, and especially Berlin, seem to be the region of predilection of the disease.

It seems surely not to be a frequent disease in America, yet it is here and in Canada too, seen in the epidemic and in the sporadic form. In the epidemic form it is chiefly observed in dispensary practice, and while I was assistant at the New York Ophthalmic and Oral Institute, I had occasion to see several epidemics within two years. In a clinical report of this institute I had occasion to report 16 cases seen in one year.

With regard to the etiology nothing satisfactory is as yet ascertained.

From my own observations it seems to me that contrary to von Graefe's opinion and that of many others, the occasional occurrence of a local diphtheritic process on the conjunctiva without combination with diphtheritic processes elsewhere and without a general disturbance, rather indicates that diphtheria is not necessarily and always from the beginning a systemic disease; although the fact, that it may become one, is not to be denied.

With regard to the treatment, the rule laid down by von Graefe and most authors is not to use any caustic treatment until the blenorrhoeic stage is reached. Before this, ice applications or hot applications, according to the indications in the case on hand, are to be made. Some recent authors advise the instillation of a quinine solution, of carbolic acid, or corrosive sublimate solutions, the inspergation of iodoform, and other antiseptic measures.

If we now review the nine cases reported above, one point is at once evident that, with the exception of case VII, they all concerned children. They were nearly all sporadic cases of conjunctival diphtheria, although most of them were observed at a time when diphtheria faucium was very prevalent in certain districts of this city. In two cases (VII and VIII) the predisposing cause was known. In case VII the eyes had been for months exposed to the vapors of bromine, while in

case VIII an operation was performed and followed by the infection.

The result in the nine cases was the following: One (case IV) a child of eighteen months, died; four corneæ in these patients (cases V, VI and VII) sloughed; in two cases (cases I and II) a small leucoma of the cornea was all the damage done; the remaining eight eyes in six patients got well altogether.

As will be seen from the report, I treated the lids which came under my observation when the diphtheritic membrane was not yet large, or during its development, at once with nitrate of silver, thinking that the coagulation of the albuminous masses would act virtually in an antiseptic sense. The results were in the main satisfactory. The quickest and best result, however, was obtained in case IX, in which a continued antiseptis was kept up by the instillations of corrosive sublimate and boracic acid. In this case I have not used nitrate of silver, nor any other caustic or astringent, but had the instillations of antiseptics also kept up throughout the blenorrhoeic stage. The result was so gratifying that I shall try it again, as soon as opportunity is offered.

TRANSLATION.

In the January, 1887, number of the *Klinische Monatsblätter f. Augenheilkunde*, J. R. DaGama Pinto makes a preliminary communication on the subject of *The Treatment of the Prolapse of the Iris in Corneal Ulcers*, of which the following is a translation:

The opinions of oculists are, as is well known, divided with regard to the treatment of the prolapse of the iris. While some would not touch the prolapsed iris and allow it to shrink and heal spontaneously, others try to shorten the process of healing by an early abscision, or by repeated slitting. In both cases an anterior synechia must result which may later on give rise to serious troubles. Aside from the irritation, the increase of tension, etc., which might be avoided or remedied by an iridectomy, an anterior synechia of the iris, since it is never sufficiently protected by the corneal scar, may allow of the entrance of infectious material into the eye, and may thus endanger it, even after several years have elapsed. It is well known that old anterior synechiæ are prone to inflame repeatedly, and that in some cases they have given rise to destructive purulent inflammations of the iris and of the vitreous body (Swanzy, Leber).

The rational treatment, therefore, should aim at the healing of any prolapse of the iris without the formation of an anterior synechia. We may sometimes succeed in this by the careful use of eserine or atropine. Yet, of this we will speak later on. If, however, this treatment does not succeed, or, if this mode of treatment does not promise success from the beginning, we must try to gain the wished-for result by operative means. Such an attempt I made in the following case:

Joseph J., æt. 21, was admitted to the Heidelberg University Clinic on August 9 on account of a recent perforation of the

left cornea, after this eye had been diseased for a fortnight. The eye is intensely red and painful. There is a prolapse of the iris, $1\frac{1}{2}$ to 2 mm. high, lying between the middle and the outer margin of the cornea; the pupil is drawn towards the temporal side, the anterior chamber shallow. Since the usual treatment with eserine and iodoform bandage was unsuccessful, I proceeded on the third day to operate on the eye. After the patient was anæsthetized with chloroform, I grasped the prolapsed piece of iris with a sharp hook-forceps, pulled it a few times to and fro, and cut it off with scissors after having carefully severed it from all its corneal adhesions by means of a probe. The result was a regular coloboma of the iris with free corners. Next morning the anterior chamber was re-established; it was, however, reopened under the protective bandage without any known cause on the fourth day after. The iodoform powder which I had dusted into the conjunctival sac after the operation had been collected in the opening of the cornea so as to form a sort of stopper. As I was of the opinion that this iodoform stopper might act as a foreign body and be an obstacle to the reparation of the loss of substance, I decided to remove it after having waited for seven days in vain. Really, three days after I had done so, the anterior chamber was again re-established, the eyeball became paler, and soon the patient could go about without a bandage. But one day, just as I thought of discharging the patient from the clinic, I suddenly found the anterior chamber empty again. It was now plain that the scar was not firm enough and at some occasion had yielded to the intra-ocular pressure. Again, treating the eye with a bandage and rest in bed, I finally succeeded in producing a durable healing. When the patient was discharged on September 26 his vision was $\frac{6}{18}$.

From this observation I would like to call attention to the following interesting points:

1. It is possible to cut off a fresh prolapse of the iris in such a manner as to leave no anterior synechia behind.
2. Iodoform, so frequently made use of as an antiseptic, may

prove a mechanical obstacle to the closure of the corneal perforation.

3. Whenever the opening in the cornea, after having been freed from the prolapsed iris, is comparatively large, the formation of the scar and its consolidation may be accomplished but very slowly.

This last disadvantage of the operative procedure, I had made use of, led me to consider whether, after having cut off the prolapse of the iris, it might not be possible to cover the opening in the cornea by some living tissue, and in this manner not only to obtain a prompt closure, but also artificially to procure some material for a more rapid and firm scar-formation. It appeared to be the nearest thing to use a flap of conjunctival tissue without pedicle for this closure.

Very soon after I had occasion to execute this idea successfully.

On September 3, Frieda M., æt. 9, was admitted to the clinic. The right cornea showed down- and inwards a roundish, deep ulcer, apparently of a phlyctænular nature, which was treated with eserine, warm applications for an hour at the time, and iodoform bandage. During the night from the 7th to the 8th of September perforation of the cornea took place, accompanied by a prolapse of the iris, 2 mm. in height. I removed the latter in the manner above described, and I covered the loss of substance in the cornea by means of a flap without pedicle taken from the conjunctiva bulbi of the same eye. On account of the shrinking which was to be expected, I took the flap about twice as large as the opening I wanted to cover, laid it with its raw side on the cornea, and pressed it into the opening with a probe. No iodoform. Compressive bandage over both eyes.

On the third day, when the bandage was changed for the first time, the anterior chamber was found to be re-established and deep. The transplanted piece of conjunctiva adhered firmly, was very vascular, and its center protruded somewhat. From this on nothing remarkable occurred. The anterior chamber remained closed permanently, the protrusion and vas-

cularization of the flaps disappeared gradually, and on October 25 the child was discharged with an eye free from all irritation. We had kept the child on purpose in the clinic for such a lengthy period, in order to be able to observe the further fate of the transplanted piece of conjunctiva. It was healed on so perfectly, that not even a line of separation between it and the surrounding tissue of the cornea could be made out.

The second case was that of a girl, æt. 16, and was operated upon by my colleague, Dr. Bernheimer, during my absence. The patient was scrofulous to a high degree and had a deep, ulcer in the lower inner quadrant of the right cornea; its fundus was covered by pus and the surrounding corneal tissue was deeply infiltrated. It looked like a case of mycotic keratitis, and we refrained from treating it with the galvano-cautery simply on account of its dangerous depth. On the third day perforation of the cornea and prolapse of the iris occurred. After the latter had been cut off, the ulcer was covered with a flap of conjunctiva. Two days after a part of the anterior chamber was re-established and the flap seemed to be firmly adherent. On the fifth day, however, it came off; yet, this did not in the least interfere with the formation of the scar, which process was then already going on nicely. The cause for the unsuccessful transplantation was probably the impure and infiltrated condition of the fundus of the ulcer, which was probably ill fit to afford the transplanted tissue the necessary nutritive material. Of course, it is not impossible that there may have been other agencies at work, which future observation may develop. Certain it seems to be, that the conjunctival cover, by acting as a sort of protective bandage, had a favorable influence on the process of scar-formation.

The third case, which has been observed but very shortly, was operated upon by Professor O. Becker. A young man, æt. 20, whose cornea bore the signs of former inflammations in the shape of a number of nubeculæ, had three ulcers on the left cornea, one of which was deep and had a gray fundus. On the third day this last ulcer led to perforation, and a very small prolapse of iris. As instillations of eserine did not affect the prolapse

in any way, it was cut off on the fourth day, and some conjunctival tissue transplanted upon it. It was, however, in this case impossible to loosen all adhesions of the iris to the cornea, and thus the coloboma partially adhered to the cornea. The result in all other respects was as satisfactory as in the first case. The anterior chamber was closed rapidly, and the flaps healed on so perfectly that to-day (seventeen days after the transplantation) it can be recognized only by the aid of a magnifying glass.

These few but decisive facts are apt to induce further investigations. After a longer experience only and with more accurate observations we will be able to come to well-founded conclusions in what kind of cases it will be possible to make a successful transplantation of the conjunctiva. The method adopted is here shortly described.

When the prolapse is not too old, it is grasped with a hook-forceps, drawn forward and from one side to the other, and, after having been freed from all adhesions with the cornea by means of a probe, it is cut off with a clip of the scissors. Then a fold of conjunctiva of the desired size is removed from the sclerotic of the same eye, laid on the opening with its raw surface and pressed slightly into it by means of a blunt probe. A compressive bandage is then applied to both eyes, which is not to be changed until the third day. On account of the shrinkage which will occur, the flaps must be made one and a half time or twice as large as the loss of substance to be covered. The conjunctival wound may be left alone, or it can be stitched together with catgut. Since it is especially important to remove the prolapse carefully and to adapt the transplanted flaps exactly, the chloroform anæsthesia is decidedly preferable to that of cocaine.

It is not unlikely that this operation may also prove useful in fistula of the cornea, and in obstinate hernia of Descemet's membrane. In such cases the region of the fistula or hernia would have to be removed by means of a trephine before the transplantation is performed.

I must not omit to mention that the merit of having first

transplanted flaps without pedicle from the conjunctiva unto the cornea belongs to Professor Kuhnt, of Jena. He tried to transplant a piece of conjunctiva without pedicle in a case of central but unperforated ulcer with success, in which the loss of substance could not be covered by a pediculated flap (Schöler-Kuhnt method). The patient died on the seventh day, and the microscopical examination proved the union of the flap with the corneal tissue.

It will be perceived, however, that the indications as well as the conditions for the healing are very different in our operation from those in this case of Kuhnt.

In conclusion, I desire to make a few remarks on the non-operative treatment of prolapse of the iris. It is well known that prolapse of the iris may heal without the formation of an anterior synechia. I can, however, nowhere find exact statements as to the kind of cases in which such a healing might with some probability be expected to take place, and I would like, therefore, to give my experiences with regard to this point. The prolapsed piece of iris may appear in two forms: Either it protrudes like a pouch, or it has the shape of a cone with its apex forward. If the opening in the cornea is comparatively small and the intra-ocular pressure in the moment of perforation is pretty strong, the iris must be thrown forward with a certain force, made to bulge by the aqueous humour and be strangulated within the perforated cornea. In this manner the first form of prolapse occurs which I have never yet seen to heal without synechia. In such cases the operation would be indicated from the beginning. When, however, the loss of substance in the cornea is comparatively large, the prolapsed iris must necessarily take on the shape of a cone in a more or less pronounced manner, and will protrude but slightly (? Translator); since in such cases there is not enough iris tissue to make a pouch which might become strangulated. This form of prolapse can sometimes after the corneal defect is repaired, retract perfectly. Instillations of eserine or atropine, according to the situation of the perforation, may in such cases be of good service when combined with a compressive bandage.

Such a perfect healing is rather frequent in children, while in the adult it is very rare, probably because in the latter the iris is more apt to become inflamed, and the corneal defect less apt to heal. In this way adhesions between both membranes will take place at an early stage, and the formation of an anterior synechia is unavoidable.

The following is the translation of an article by Chibret in the *Archives d' Ophthalmologie* on "*A Simple Mode of Treating Panophthalmitis*."

The use of antiseptic methods has almost caused the disappearance of the violent forms of panophthalmitis which we used to observe after cataract extractions. In spite of that, however, such cases of panophthalmitis as yet present themselves often enough to us as the results of neglected injuries to the eye.

The patients come to us with an enormously swollen eye, extreme pains, and all symptoms of a deeply-seated suppuration with constriction. Making an opening will, by favoring the evacuation of the pus which is formed, give ease, but the suppurative process goes on for many days yet.

The enucleation, as well as the exenteration, shoot beyond the mark, and since at least one of these two operations is not without danger, it seems to me they should both be shunned.

For two years I have systematically made use of the antiseptic method in suppurative inflammation of the eyeball and in eight cases I have operated as follows:

1. A large incision into the cornea, forming an inferior flap as for the extraction of a cataract, dissection of the capsule and extraction of the lens. The pus flows out.

2. When the fluid pus has stopped running off, I search for the thick and adherent pus by means of a pair of iridectomy forceps; injections of a solution of corrosive sublimate into the vitreous body are made alternating with the manoeuvres made with the forceps. I extract in this manner shreds of semi-purulent vitreous, and do not stop until I am satisfied that there is no longer any trace of suppurating tissue within

the walls of the eyeball. An injection which returns clear and the appearance of healthy vitreous body are the signs which allow us to assume, that we have not left any suppurating portions behind. A last intra-ocular injection of corrosive sublimate (1 in 2,000) ends the operation; a compressive bandage is applied to the eye, and for some months I have added a permanent collyrium of cocaine and iodoform, as I have recently recommended.¹

The result is a marvellous quietude which follows immediately after the operation. Fever and pain disappear in twenty-four hours.

For the following two days it is well to renew at every change of the bandage the sublimate injection, and on the third day the patient may be allowed to go home, with the suppuration stopped and the eye on the way to recovery. If I compare this result with those reached by an expectative treatment or by a simple opening, by the enucleation or exenteration, I do not think it useless to publish this simple method which is free from danger and more rapid in its good effects than anyone of those which are now being employed.

The following is taken from the *Centralblatt fuer Praktische Augenheilkunde* and is an extract from a paper by Jegorow

The "permanent collyria" recommended by the author in the June number of the *Revue Clinique d' Oculistique*, 1886, are described by the author in the following way.

I take a thin elliptic layer of cotton, 20 by 15 mm., and put on it an ointment having for base vaseline and white wax and containing iodoform and cocaine, or any other alkaloid. The cotton is folded over this ointment so as to enclose it, and the whole is introduced into the lower conjunctival cul-de-sac by means of a probe.

The permanent collyrium remains in the bandaged eye two or three days, and the quantity of cocaine is sufficient to insure a deep anaesthesia for twelve hours. It contains some cocaine yet, after having lodged in the cul-de-sac for forty-eight hours. The iodoform is absorbed, and iodine is found in the urine after forty-eight hours. The iodoform acts as an anaesthetic as well as an antiseptic. * * *

* * * These permanent collyria are very well borne by the eye, and hasten the cicatrization after the operations. This action is due to the hypotonic condition induced by the cocaine and to the influence of the iodoform upon the old or recent wounds.

(which appeared in the *Archives fuer Physiologic*) *On the Influence of the Long Ciliary Nerves on the Dilatation of the Pupil.*

The experiments were made on dogs and cats under the supervision of Dogiel, and led to the following results.

All dilating nerves enter the eyeball near the optic nerve entrance without having joined the ganglion ciliare. After section of all long ciliary nerves the pupil contracts, but remains regular in shape. If then the cervical portion of the sympathetic nerve is cut, the pupil does not contract any further, nor does electric irritation of the peripheral stump of the sympathetic or of the central stump of any sensory nerve cause dilatation of the pupil. If not all of the long ciliary nerves were cut through, the pupil contracts also, but its shape is irregular, just as is the case (according to Voelcker and Hensen), when the short ciliary nerves are irritated. If, now, the cervical portion of the sympathetic be cut through, the pupil becomes still further contracted and its shape more regular. If then, the peripheral stump of the sympathetic is irritated, or the central stump of a sensory nerve, the pupil becomes dilated, it appears, however, now more irregular in shape than before. Irritation of isolated peripheral stumps of the long ciliary nerves will cause the pupil to dilate; this result will appear more promptly by the branch which perforates the upper portion of the musculus retractor bulbi than by means of the long ciliary nerves which accompany the optic nerve. This branch goes to the upper and outer segment of the iris, its irritation; therefore, causes a dilation of the upper and outer portion of the pupil.

It is proven by these experiments that the pupil-dilating nerves leave the ganglion Gasseri with the first branch of the trigeminus nerve, and go, without passing through the ganglion ciliare, by way of the long ciliary nerve, directly to the iris.

CORRESPONDENCE.

DEAR MR. EDITOR.—The accompanying cut of my *spool advancement needle* was recently received from Tiemann with the request that an account of it be given to some medical journal for publication.

Its necessity first became evident about six years ago. In attempting to correct an internal strabismus of moderate degree, the capsule of Tenon was sufficiently lacerated to allow the tendon to retreat so much as to occasion an extreme external squint, decidedly worse than the original deformity.

Stimulated by the prospect of disgrace, I extemporized a hook, after drawing the temper of a surgical needle, and fortunately succeeded in advancing the retracted muscle, which was then secured to its proper place with a perfect cosmetic result.

A study of this case developed the operation of "advance-



FIG. 5.

ment of the rectus," together with the capsule and conjunctiva published in the *St. Louis Medical and Surgical Journal*, June, 1881, and in Noyes, *Diseases of the Eye*, p. 116. The operation was improved by a *pulley modification*, which appeared in the *New York Medical Record*, August 8, 1885, with a cut of the needle then in use after the manner of the cork-screw-staphyloraphy needle.

The antiseptic importance of keeping the thread from touching the face, hair or clothing together with the realization of its extensive usefulness in canthoplasty and other operations on the conjunctiva led to the conception, that it merited a spool in the handle, to carry antiseptic silk, shielded from contact with pyogenic organisms.

This requirement was met in August, 1885 by the introduction of a bobbin (Fig. a.) to carry about thirty feet of silk—which issues from a very small opening in the shield and passes through the eye of the needle (b) to be caught by toothed forceps—after the tissues have been transfixed.

The loop suture for advancement is made by transfixing the rectus a second time from within outward, catching the thread and withdrawing the needle before cutting it off. The thread for the anterior fixation point (pulley) should be entered one or two mm. from the cornea, slightly into the dense tissue, which purpose is better served by the sharpness and delicacy of Tiemann's No. 25 eye needle. This thread is then tied to encircle one branch of the loop suture in a form of pulley over which it is drawn to any degree of tightness, and tied with a surgical bow-knot, to be modified or made secure after an interval, when a perfect position shall have been established. The silk which has been employed is Tiemann's iron-dyed No. 2. It is first soaked in a $\frac{1}{10}\%$ sublimate solution, dried, waxed (to prevent untwisting), and treated with iodoform in vaseline 3% when, wound on the spool, it is always ready for use.

Very respectfully,

A. E. PRINCE.

JACKSONVILLE, ILLS.

REVIEWS.

A TREATISE ON SIMPLE AND COMPOUND OPHTHALMIC LENSES, THEIR REFRACTION AND DIOPTRIC FORMULÆ. INCLUDING TABLES OF CROSSED CYLINDERS AND THEIR SPHERO-CYLINDRICAL EQUIVALENTS. By Chas F. Prentice. Published by James Prentice & Son, New York.

This little book we highly recommend on account of its clear style and the simple way in which it explains the subjects it deals with. The author says in the preface that he hopes through graphical and analytical means to guide the reader upon a path by which he may gain easy access to an understanding of the subject without recourse to mathemati-

cal dioptrics, and we think that he has succeeded admirably. The numerous illustrations are of the best, and even the novice, to whom the book is addressed, will be able to comprehend all the intricacies of the subject.

We personally regret that the author uses the terms *dioptric*, the original one *dioptry*, appearing to us also the more correct one, as we have already stated at other occasions.

This little work should have a large circulation. ALT.

SKIZZENBUCH ZUR EINZEICHNUNG OPHTHALMOSCOPISCHER BEOBSACHTUNGEN DES AUGENHINTERGRUNDES. VON Dr. O. Haab, Docent der Augenheilkunde in Zürich.

Haab's Ophthalmoscopic Sketch-book is meant to simplify the representation of ophthalmoscopic conditions, and it does this so successfully that it should receive a hearty welcome from those who, with neither training nor talent for the use of water colors, often feel keenly the lack of ability to obtain any thing like an accurate copy of rare conditions of the fundus.

The essential part of the book is a series of plates with red back ground of the fundus already laid on. By means of a peculiar rubber this red can be partially or wholly removed so as to give every variation between the original red and a pure white; and with the aid of a black lead-pencil and two shades of red crayon, nearly all the variations of color which the normal and pathological fundus reveal can be reproduced with remarkable accuracy. No adequate idea of the advantage of this erasable red background can be given by a description; practically, it enables one to do in a few minute what an unskilled hand would either be unable to do at all, or would require hours by ordinary methods.

The author in his preface urges very properly the advantages of making drawings of the fundus, not only in extraordinary cases, but in all cases of active disease of the fundus where it is important to keep accurate accounts of the changes for better or worse.

The book is published in English and German, and can be had in New York City of G. A. Stechert, 766 Broadway, and of Steiger & Co. G. (Omaha).

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No. 3

A DECIDED IMPROVEMENT IN THE CONSTRUCTION OF LACHRYMAL PROBES.

BY SAMUEL THEOBALD, M. D., SURGEON TO THE BALTIMORE EYE, EAR AND THROAT CHARITY HOSPITAL.

Some months since Mr. Charles Williams, manufacturer of surgical instruments of this city, advised with me as to the advantage of substituting aluminium for silver in the construction of lachrymal probes, and at the time it was agreed that he should make some probes of this metal. He found, however, that aluminium is not capable of being soldered, and as no other method of attaching the central shield to the probe occurred to either of us at the time, the experiment was temporarily abandoned. Afterwards he suggested that, at least with the larger size probes, there would be no difficulty in attaching the shield by means of rivets. Accordingly, in October last he made me an aluminium probe in this manner, the size being numbers 15 and 16 of my series. The chief advantage which we thought the new probe would possess was lightness, which would be a desideratum in the larger size probes. I found, however, that it had another advantage, which was of still greater practical value—its surface was much smoother and

more slippery than that of the silver probes, so that it could be introduced into the nasal duct and withdrawn from it with greater ease. The difference, indeed, is so marked that patients can usually distinguish the aluminium probes from the silver ones by the less amount of pain which attends their introduction and withdrawal.

In appearance the aluminium probes closely resemble the silver ones, the former metal being of a blueish-white when contrasted with the yellow-white of the silver. They are also of about the same stiffness as the pure silver probes. The specific gravity of aluminium being but 2.56, whereas that of silver is 10.4, it will be seen that the difference in weight is about as one to four. In fact, the numbers 15 and 16 silver probes weigh about as much as the whole series of eight probes (16 sizes) would, if made of aluminium. This quality of lightness is of real advantage with the larger probes, because it facilitates delicacy of manipulation; besides, the difference in weight is appreciable to the patient.

I have become so well convinced of the advantages of the aluminium probes, that I now employ them in both hospital and private practice in preference to the silver ones. Mr. Wilens¹ has found it practicable to make probes as small as numbers 7 and 8 of the new metal. For the sizes smaller than these coin silver answers better. I have also had him make me several sizes of aluminium styles, and, although I have not yet found occasion to employ them, as I seldom resort, now, to this plan of treatment, there can be no doubt that they will answer an excellent purpose, the difference in weight being of still greater importance here than with the probes.

In this connection I cannot forbear to add a few words to what I have said heretofore as to the practicability and advantage of using the very largest probes of my series in treating the great majority of nasal duct strictures. Upon this point I still find a great deal of scepticism, and, although I am frequently told by ophthalmic surgeons that they have been using my probes with much satisfaction, I usually find upon making the inquiry that they have not ventured to employ the largest

sizes. It is doubtless possible to cure many cases without doing this, but, as a rule, there can be no question that the cure is hastened, and the risk of a relapse greatly diminished, by the introduction of as large a probe as is practicable—and this

in at least two-thirds of the cases occurring in adults, means number 16. In a series of thirty-four cured cases which I have reported in tabular form in an article upon "Affections of the Lachrymal Apparatus," contributed to Wood's Hand-Book of the Medical Sciences,¹ there are but thirteen cases in which a number 16 probe was not employed, and in seven of these number 15 was used. Of the remaining six cases, only one (in which number 13 was used) was in an adult. The other five cases, in which number 14 was used twice, number 13 twice, and number 12 once, occurred in children varying in age from four to sixteen years. To this list I can now add six additional cured cases, occurring in adults, in four of which number 16 was used, and in two number 15.

It is my practice now, in all cases, to use cocaine before probing the duct, and although this does not render the operation painless, it, at least, makes it much more tolerable. I have also thought that the pain caused by the presence of the probe in the duct, and by its withdrawal, is lessened by adding cocaine (10 per cent) to the vaseline with which the probe is annointed previous to its introduction.

As but few of the makers of surgical instruments seem to have a correct idea of the curve and the shape of the ends of my probes, and the cuts in their

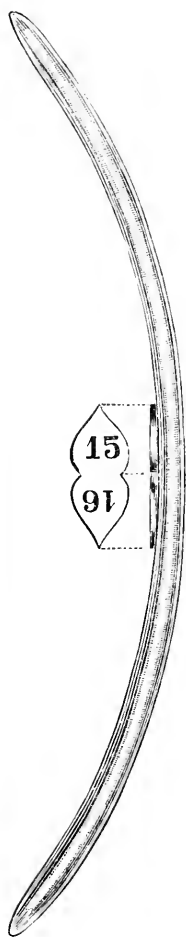


FIG. 6.

¹ Charles Willens & Co., 224 N. Howard St., Baltimore.

² Vol. IV, p. 366

catalogues usually misrepresent these, I reproduce here a correct representation of the largest of the set,¹ numbers 15 and 16, the illustration being of the actual size of the probe.

KERATITIS BULLOSA.

BY DR. S. C. AYRES, CINCINNATI.

This rare form of corneal disease is seldom seen even by those who have the opportunity of observing large numbers of cases in hospital and private practice. Its diagnosis is not difficult, as its objective and subjective symptoms are very pronounced. It occurs not only in eyes which have been previously healthy, but in those which have suffered from trauma. It seems to be frequently associated with increased intra-ocular tension, but in the three cases which I report this was not the case. The peri-orbital neuralgia associated with this disease is frequently of a very severe type. The vesicle sometimes ruptures spontaneously, and then there is an intermission from pain until it reforms—showing that the stretching of the corneal nerves is the cause of the pain.

CASE I. Mr. J. E., 33, had his left eye injured about two and a half years ago by a nail, which he was driving. It struck the outer side of the cornea, producing a deep irregular wound followed by prolapse of the iris. The wound healed slowly, but the eye remained tender for a long time. The inner portion of the cornea is still transparent, and the iris can be seen drawn over to the scar on the outer side. For several months past the eye has been so sensitive as to interfere with his work at times, and recently he had to stop entirely. The outer half of the cornea is very sensitive to pressure, and presents a cicatrized appearance in the center of which is a point of pig-

¹ Eight double probes (16 sizes) constitute the series. The smallest, number 1, has a diameter of one-fourth mm.; the largest number 16, a diameter of four mm. there being a difference of one-fourth mm. between the diameters of the succeeding numbers.

ment—probably the remnant of the incarcerated iris—the epithelium over the scar is raised in a bleb-like form, and is filled with transparent fluid.

The treatment in this case consisted in tearing off the raised epithelium and cauterizing the edges of the vesicle with carbolic acid. This latter was done by means of a stick dipped in pure carbolic acid, and the cauterization was limited to the periphery of the bleb. Then iodoform was dusted on the cornea. This operation had to be done four times before the vesicle ceased to form—but each time the vesicle was smaller. In a short time after his return home he was able to resume work again.

CASE II. Miss T. has a circumscribed infiltrated spot in the center of left cornea about 3 mm. in diameter. It has been affected for the past six months. The eye at times is painful, and is always quite sensitive to light. The lower portion of the cornea is vascular, and above it the epithelium is raised in a bleb-like form. The pupil dilates *ad max.* There is no history of trauma, and previous to the development of this trouble her eye had been very strong.

She had been treated by atropine and eserine, but all to no effect. I began the treatment as in the other case, by tearing away the raised epithelium and cauterizing the periphery of the bleb with carbolic acid. This seemed to have some beneficial effect, but it did not prevent the bleb from reforming. I made paracentesis corneæ, but this was rather disappointing in its result. The bleb reformed, although it was much smaller than at first. As the central portion of the cornea was in a necrotic state, I decided to remove it by scraping, and did so with excellent results. The scraping was done with a spud, and was always attended with considerable hæmorrhage from the cornea; the walls of the necrosed pit were treated with carbolic acid and then iodoform dusted on. Gradually the infiltrated cornea cleared, and the necrosed pit filled up until finally there was left only a dense saturated scar. This was tattooed very successfully.

CASE III. A delicate girl, aged 14, who was treated by my

partner, Dr. E. Williams. The vesicle was situated in the lower portion of the cornea, and measured about 3 mm. in diameter. The cornea was in other respects very healthy, there being no infiltration of the cornea behind the vesicle. The pupil dilated freely, showing that the iris was not implicated. She suffered from the severe orbital neuralgia always associated with this disease. The vesicle was torn off two or three times, and pressure bandage applied. Finding this did not promise a favorable result, as the vesicle always reformed in a few days, he touched the corneal surface with a stick of mitigated nitrate of silver. This accomplished a cure, but it left a small scar.

Kleinschmidt, Inaug. Dis. Bonn, 1876, reports two cases, one following an injury from powder explosion, and the other a severe keratitis.

Schmitz, Augenklinik, Cologne, 1874-75, reports one case following keratitis and accompanied with periodical ciliary neuralgia and photophobia.

Schiess, Gemuseus, klin. Monatsbl. f. Augenheilk, 1881, observed in an old lady, 81 years of age, numerous small shining vesicles on the cornea. They were finally relieved by pressure bandage.

Also Jahresbericht der Augenheilanstalt in Basel, January, 1883. One case where the vesicle was twice torn away and an iridectomy made, and where the yellow salve seemed to accomplish the cure.

MacKenzie, in the edition of 1855, speaks of dropsy of the cornea or chronic vesication of the cornea.

This rare form of corneal disease was first definitely described by Von. Graefe in 1855, in vol. 2 of *Graefe's Archives*. He states that in the first three years of his practice he had seen only one case. In the fourth year, among about five thousand patients, he had seen four persons so affected.

Weber, in vol. vii., *Graefe's Archives*, describes a case similar to Graefe's, except that there were five or six small blebs and one large one; but they were all filled with transparent fluid.

Cowell, in R. L. O. H. Reports, 1869, mentions four cases of vesicles of the cornea, in two of which there were vesicles on the skin also.

Pooley, in vol. iv., *Archives of Ophthalmology*, describes a very interesting case of keratitis vesiculosa which preceded an attack of glaucoma, which destroyed vision.

Brière, Ann. d'ocul. 70, p. 92, 1873, reports a case of keratitis bullosa associated with increased intra-ocular tension.

Landesberg, *Archiv. of Oph. and Otol.*, 1877, gives a detailed statement of seven cases which had come under his observation. In all of them there were increased intra-ocular tension. He characterizes the disease as "a deep and localized inflammation of a part of the cornea, with the tendency to acute exacerbation, of which the vesicle on the surface is only the last link of the chain of symptoms."

AN INTERESTING CASE OF TOBACCO AMBLYOPIA IN A LADY.

BY JULIAN. J. CHISOLM M. D., BALTIMORE, MD.

Mrs. A., æt. 40, consulted me for faulty vision which glasses would not relieve. About three months since she found reading beginning to be difficult. Knowing that she was approaching the age when spectacles would be required, she visited an optician and obtained a pair of convex glasses. These served her for a short time only and then became useless. She made further efforts to obtain useful glasses, but without success. In the meantime her vision was becoming more foggy. It seemed to her that she was living in a smoky atmosphere. Everything was in a haze, whether she was looking at near or distant objects. Finding no glasses to aid her, at the suggestion of her physician she had come from her distant home to put herself under treatment. She was a handsome woman, whose dress, deportment and language indicated culture. I found her distant vision $\frac{15}{10}$, each eye alike, which no glass improved. She could decipher slowly No. +10 of Jaeger's test types, but that would not permit her to read ordinary book print, which she could readily do three months ago. She had in a measure lost appreciation for colors, the red and green had assumed brown and gray tints and looked dull.

I examined her eyes thoroughly with the ophthalmoscope. I could find no disease in either of them. The fundus was perfect with clear media and with sharply outlined discs and vessels. I could detect no change in color at fovea nor of the optic disc. I was at a loss to account for the dull vision, as she seemed in every respect a perfectly healthy woman, and in response to her earnest inquiry told her so. After some conversation about the obscurity of her case, I ventured to say

that were she a man I would call her case one of tobacco poisoning. At this suggestion she laughed heartily, and then confessed that she did smoke a good deal. Naturally, I desired to know how one with her education and refinement had acquired so unusual a habit for ladies. Her history was soon told: "I married when quite young and went to live with my husband in North Carolina, where he had a very large farming interest. He owned so extensive a tract of land that neighbors were far away and I saw but little of them. I have had no children and during many long winters my husband and myself have been the sole occupants of our country house. My husband had always been devoted to his pipe, which he takes up as soon as he gets into the house after overseeing his farm work. Often during our early months of married life he would call upon me to fill it for him, and at times would even dare me to light it. By degrees I found myself able to take several whiffs of tobacco smoke without discomfort. At his request I learned to smoke, as he said for companionship, and for many years I have taken my pipe with regularity." The cause of the amblyopia was now surely traced and the remedy was equally clear: Under advice she stopped promptly the use of tobacco and for two months used strychnia in full doses, at the end of which time her sight was completely restored. The lady did not drink even wine. This was clearly a case of tobacco poisoning which had only commenced the annoying and which the abandonment of the use of tobacco promptly relieved.

I live in a tobacco growing country where the smoking of tobacco is nearly universal; not substitutes for tobacco, but the tobacco pure and unadulterated. Chewing is less common and snuff taking is the decided exception. Cases of amblyopia traceable clearly to tobacco I see frequently, and I have the gratification of knowing that sight is often restored if the habit of smoking be absolutely given up and strychnia be used. I have never seen poisoning from the use of snuff; nor have I ever met with a case of tobacco amblyopia from chewing alone. I have never seen the sight affected under less than ten years use of the weed, in proof of the slowness of the poi-

soning. My youngest patient was only twenty-seven years of age, but he had been smoking since boyhood.

It is not always the amount of tobacco consumed which affects the nerves, although most patients acknowledge the abusive use of the article. Unfortunately for those who are enslaved by it, and who seek from its soothing influences, a solace when in mental trouble, the anxiety caused by the inability to read and the interference with literary work, finds more time and a greater desire for the pipe or cigar. This increase of smoking causes a still more rapid deterioration of vision. It is not every one abusively using tobacco who shows evidences of the poisoning. I know persons who have averaged from fifteen to twenty strong cigars in the twenty-four hours and who have kept this up for years without inconvenience. Others break down under a comparatively small amount, too little apparently to explain the effects. Usually from six to ten cigars are acknowledged, or a similar number of pipes. I have seen a case of tobacco amblyopia clearly traced to the use of one cigar a day, which strychnia in large doses could not relieve, and which disappeared promptly when this single cigar was given up. One unfortunate, when told that his impaired sight was due to tobacco poisoning, remarked that it was impossible, because he only smoked a half of a cigar a day (laying emphasis on the half). Naturally, I asked, why do you restrict yourself to a half cigar. The answer came that by the time he got half of a cigar smoked he would often feel so sick that he would have to lie down. For years he had been learning to smoke. Taunted by the gibes of his companions, he had determined to acquire the habit, cost what may, even if he had to take the nauseous dose in half cigars. With so good an excuse as the loss of sight was occasioning him, he willingly consented to abandon the attempt and his sight responded promptly to the withdrawal of the poison. In his case the susceptibility to the toxic effects of tobacco was an idiosyncrasy not often seen.

In the treatment of tobacco amblyopia, I always urge the immediate and absolute abandonment of tobacco in every form, no tapering off by diminishing the amount from day to

day. I then prescribe strychnia pushed to its full physiological effects. I never commence with less than $\frac{1}{20}$ of a grain taken three times a day and always after eating. I find this amount easily borne by adults. I administer it in pill form. I have often experimented by hypodermic injection and by the mouth. Giving alternate doses, under the skin, acts the more promptly, but not the more efficaciously. As the injection was often painful when frequently repeated I abandoned this mode of administering strychnia for the pill, the object being not sudden impressions, but permanent nerve stimulants. I find that by degrees the dose can be increased with benefit till $\frac{1}{10}$, $\frac{1}{8}$ or even $\frac{1}{5}$ grain three times a day can be taken and then kept up for weeks until the desired effect of retraced vision is obtained. If at any time muscular contractions are induced by the increase, the dose is diminished to the one previously taken with comfort. I have seen marked improvement in vision occur from an $\frac{1}{8}$ or $\frac{1}{6}$ of a grain which $\frac{1}{10}$ gr. three times a day did not bring about. In the administration of the $\frac{1}{20}$ grain granule three times a day to begin with, an additional pill of $\frac{1}{20}$ grain can readily be added every fifth day to the days dosing. The system acquires a tolerance of the increasing doses, till even $\frac{1}{5}$ of a grain or 4 pills of $\frac{1}{20}$ grain each at a dose after meals can be safely administered. I have never seen any injury from this heavy dosing nor even annoyance provided the increase be slow.

TRANSLATION.

FRIEDRICH HORNER—1831 TO 1886.

On the twentieth of December, 1886, an eminent representative of our profession died at Zuerich, whose labors in ophthalmic science and for the benefit of humanity were of high merit, and from whose pen the pages of this journal (*Monatsblatter f. klin. Augenheilkde*) have often brought an interesting communication, or an original study.

He was one of the many young scholars who, coming from the school of Graefe, carried in all directions as an evangelium the more thorough investigation, the exacter examination and the more rational treatment taught by their master. They began their career emulating their master in industry and kindness, proud of the astonishing progress of their science, and everywhere they went, they brought with them a decidedly clearer knowledge of the diseases of the eye, and a higher faculty and better weapons to fight these ills.

Although most European [and a number of American, Translator] oculists were personal friends of the late Professor Horner, or at least knew him, the readers of this journal may like to have some further knowledge of the life of one who was taken from us too soon.

Friedrich Horner was born March 27, 1831, in Zuerich, the son of an able and honored physician. Though of poor health, the intelligent and highly talented boy visited the different schools of his native city and the gymnasium. Professor Hermann Sauppe, who at that time taught at the latter school, seems to have taken an especial liking to this pupil. When forty years later this teacher came as a delegate from the university of Goettingen to take part in the celebration of the fiftieth anniversary of the university of Zuerich, he there found

his former pupil, Friedrich Horner, as a highly honored and eminent teacher.

In the spring of 1849 Horner matriculated at the Zuerich university. There Professor Ludwig, then teacher of anatomy and physiology in Zuerich, lastingly influenced him by his exact studies, and by the way in which he strictly severed the well ascertained from the doubtful.

Botanical excursions in company with Oswald Heer, who later on acquired world-wide renown, by the exercise in the air, exerted a favorable and permanent influence upon his health. Furthermore, it is likely that these studies in natural history influenced also the later career of the young man, since his high faculty of observation, a rapid and correct conception of what he had seen, became evident to the boy himself and to his father.

At that time fate dealt harshly with his family. His older and talented brother, Conrad, who devoted himself to the study of classical philology in Bonn, and who seemed to have a brilliant future before him, was attacked by heart-disease, came home and died a few months later, only twenty-two years of age. A month later his father had an apoplexy, when returning from a call to a patient and died the same evening, his last looks upon his now only son. But a few months later his mother fell ill, and near the end of the year she was buried, having given over to her relatives the care for the only son and his four younger sisters.

Thus the family was broken up and Friedrich Horner in his loneliness was stimulated the more to diligent and energetic studying.

He then went by way of Muenich and Regensburg to Vienna, where he listened with great interest to the teachings of Oppolzer, Skoda, and especially of Hebra whom he called an empiricist of the best kind. His dermatological studies at the Vienna school left their imprints on him, and later on the lasting influence of this school upon his observation of skin diseases could easily be recognized in his rational and accurate differentiation of diseases of the cornea. He also entered into

friendship in Vienna with a number of young men whose names later on were often heard of, as Dr. Schneller, of Danzig, Wilhelm von Zehender, and his intimate friend Wilhelm Hess, of Mainz.

The director of the ophthalmological clinic at that time was Rosas, but the younger follower of ophthalmology met rather with Friedrich Jaeger at a smaller but valuable polyclinic, where Edward Jaeger taught the technics of the ophthalmoscope.

At that time the young Berlin scholar began to be much talked about, and the more intrinsic studies of Graefe as well as the physiological labors of Von Helmholtz drew the eyes of all toward Berlin. The reports of Zehender and the admiration of Friedrich von Jaeger for his young Berlin pupil, in short, all things worked together to draw Horner to Berlin, which he reached the middle of October, 1854.

In Graefe's clinic, which in the absence of Graefe during the holidays was in the hands of Dr. Michaelis, Horner for the first time met his friend, Dr. Baenziger, and later on a number of later on well-known workers, with whom he became befriended, as Dr. A. Pagenstecher, Dr. von Troeltsch, Rothmund, of Muenich, Nussbaum, who was already known on account of his experiments with artificial glass corneæ, then Dr. A. Weber, of Darmstadt, and others.

Graefe returned in the early part of November, and Horner entered himself as his pupil. The inspiring influence of the ingenious master, his taking personality decided the further course of Horner's life and career. On the 22nd of November, 1854, he was made polyclinical assistant to Graefe, and thus his practice took up all his time, and procured him an immense experience in a scientific as well as in a practical direction.

Horner remained with Graefe until October, 1855, however, from May of that year in a freer position, since he had to spare himself on account of a severe attack of trachoma. There was so little difference between the age of the master and that of the pupil, that their intercourse from the beginning was that of colleagues, and, by the inspiration and the dili-

gence of the one and the recognition of the other, this soon ripened into an intimate friendship. The latter lasted unchanged until the death of the beloved teacher and friend. This would certainly have been impossible, had not Graefe found in his assistant the same noble, devoted and humane mind as his own, aside from his high talent and faculty for work.

All reports of this period, which was filled with all sorts of experiments, and in which so many questions were raised and so many of them answered correctly, state that the intercourse between Graefe and his followers was an extremely agreeable, almost intimate one. The young ophthalmologists not only met during the hours of teaching, but also every Thursday at Graefe's home, and during the week they had a regular meeting where a paper was read and discussed.

This time in Berlin was for Horner an extremely happy one and of important influence in shaping his future career.

Enthused by the ingenious master, his activity and his noble heart, Horner left Berlin and went to Paris. There he was attracted by Nélaton and Ricord, and especially by Desmarres, the father, who as Graefe's friend and assistant, received him warmly. Early in 1856 he returned to his native city and began there to practice his profession, and in May, 1856, he began to teach therapeutics at the university. He made his inaugural speech May 1, and his theme was the results of the ophthalmological examinations upon the physiology and anatomy of the eye, further on he spoke of the macula lutea, papilla optica, transparency of the retina, blood-pressure, arterial and venous pulse, and he finished off with a few short remarks on the more recent understanding of the pathology of the eye.

September 7, 1857, a number of young physicians met with Graefe at Heidelberg, and founded the now well-known Heidelberg Ophthalmological Society. Von Arlt was present at nearly all their meetings. On September 12, the International Congress of Ophthalmologists met at Brussels. There Graefe read his celebrated paper on the influence of the iridectomy

in glaucoma. This paper was received with applause, and on their way home on the Rhine Hess and Horner helped to get it ready for print. In Mainz they separated, and thus Horner came back home in October, 1857, strengthened and refreshed, and felt as if drawn to and introduced into the ophthalmological science by an invincible, but friendly, hand.

In 1861, when Locher-Zwingli, the professor of both the surgical and the ophthalmic clinics, resigned, the faculty unanimously advised a separation of the two chairs, and the engagement of Billroth and Horner for them respectively. Billroth alone was chosen. When, however, during the following year Horner received a call to the university of Bern, he was given a clinical ward at the Canton's Hospital and the professorship. Thus a large field was opened for his activity, and he had reached a position which, worthy of his talents, gave him the opportunity for the most fruitful work with his eminent gifts and his complete technical knowledge.

Horner's work in our profession was in three directions. He was practitioner, teacher and investigator.

For the practice of his profession he possessed a rare combination of valuable peculiarities which may be shortly summed up in the following manner: the gift of critical observation, the penetrating mind, authority, technical ability and finally the good and humane heart which he had inherited from his noble family, but which had been considerably enlarged by the influence of the immortal master. These gifts of the practitioner coupled with a decided administrative talent enabled him to take care of his continually increasing practice. From far and near suffering patients in continually growing numbers came to him, to seek a cure or improvement, poor and rich, from the laborer up to the princes of the neighboring countries.

Twenty years ago he founded a large private asylum of his own, the Flattinger Hof, where one of Berthold Auerbach's stories (Brigitte) plays, whose author had himself stayed there for some time. Besides the security with which Horner operated, we have to mention especially the power with which he

subdued the most refractive patient, and, furthermore, the conscientiousness with which he studied every case in order to come to a diagnosis to found his treatment on.

Far from giving the patient empty words, when his examination had not led to a certain result, he simply and openly stated so to the patient, and surely his reputation was not hurt by that in any way.

The ophthalmologists have to thank Horner for a great deal, his teaching quality was eminent; without losing himself during the clinic in general descriptions, he always considered the case before him as such, and discussed with excellent perspicuity all its conditions, the etiology, diagnosis and treatment. Himself well educated in general medicine, he treated with predilection on the relations between eye-affections and general diseases. This faculty enabled him better than others to explain even to the novice such causal relations. None knew better than he how to grasp the existing symptoms, to deduce from them the nature of the lesion, and thus to find their deeper lying causes step by step. His free diction attracted the students and often inspired them for science. To hear Professor Horner was always a pleasure, an enjoyment and a gain. We must further admire the manner in which he knew, how to stimulate the interest of his students, how to introduce them into these special studies, and how he gave them subjects for their own examination and elaboration.

In his capacity as investigator he has in this journal published a great number of clinical observations, full of new facts, ingenious thoughts, and indications for the enrichment of our therapeutics, and which are as yet fresh in the minds of our readers.

To him, too, we owe a systematic treatise on the eye-affections of children (Gerhard's *Lehrbuch der Kinder-Krankheiten*, Tuebingen, 1882). This book is not finished, yet it has got so far, that the affections of the cornea, the *crux* of young physicians, are completely treated on, and in such a manner that whosoever will go to the trouble to study it thoroughly, will surely reap great pleasure from it in his practice.

A separate group of his works is formed by papers on hygiene, a subject he treated practically as well as theoretically. His labors in favor of the hygiene of schools and industries have been especially meritorious. Like other high-minded and broad-hearted men he has, as citizen, served his country in many ways and in different offices. We will only mention one of them: The foundation of the Children's Hospital in Zuerich in conjunction with his friend, Dr. Cramer of Mailand, who made the first donation to this humane institution.

His worth as a colleague and a friend is best known to those who for so many years have met with him regularly in the Heidelberg Ophthalmological Society, and who have spent valuable moment with him in the circle of friends. Alas, that it was not ordained, that he should be able to enjoy a few years of rest after so much of hard work. Just at the time when his two children came to be of the proper age to enjoy most their father's mind, sickness, and with it sorrow and pain, came on. During the year 1885 he grew weaker, and at the Heidelberg meeting all his friends noticed with anxiety how laborious his breathing had become; yet the scholar's mind was as yet fresh. While speaking at that meeting he was already suffering from an exudation into the pleura, which had not yet been diagnosed, due to disease of the kidneys and blood-vessels, and which soon grew worse, and endangered the existence of our friend during the following winter. Next spring he somewhat improved, and after he had spent the summer at the beautiful Interlaken, his strength returned to such an extent, that he could think of returning to his professional studies, and actually did so. He had hopes of a new lease of life, and enjoyed daily that it was again given him to work with success. Just when all were apt to forget the danger, the catastrophe came. On December 15, 1886, in the evening, while he was surrounded by his family and in lively conversation, an apoplexy of the brain overtook him. He diagnosed himself the hemiplegia, and knew its cause at once. Well knowing, that he would not for a much longer time have thoughts and words at his disposal, he made use of the re-

maining time to say good-bye to his family in warm words and to express his last will. Then aphasia came on and later on unconsciousness, and on the twentieth of December, in the forenoon, this life, so rich, came to an end. A large number of mourners followed his funeral. Thousands near and far, in mind at least, were present at this ceremony, for not Zuerich alone and Switzerland, but the civilized world, science and humanity, had lost one of their noblest representatives (Dr. M. DUFOUR, in *Zehender's Mittheilungen f. Augenheilk.*).

CORRESPONDENCE.

A QUESTION IN PROFESSIONAL ETHICS.

SALEM, MASS., March 3, 1887.

To what extent does the vending of glasses by oculists and the receiving of commissions from opticians "advance ophthalmic science and art?" It is generally considered reprehensible of general practitioners, who live where there are competent apothecaries, to sell medicines to their patients, and the same may be said if they accept any allowance from the apothecaries who prepare their prescriptions—although this pernicious practice is, doubtless, much indulged in. Now as to oculists.

Quite recently the writer received the following proposition from an optician in Boston: "We beg leave to state that you are entitled to 20 per cent. of the gross amount of all business you may wish to throw in our way, and this is payable monthly."

The same party said to him—*sub rosa*—that a rising oculist offered him a moiety of all first, and also of all subsequent fees, received from patients sent from his shop—which, assuredly, was a liberal offer. He further stated that another gentleman referred his patients to him, with the formulæ for glasses, but with the understanding that they were not to settle with the optician for them, but that they should do this on returning to the oculist.

In the matter of cylindric glasses, it would be easy to prove that it is by no means unusual, for ophthalmic surgeons of good standing (members even of the American Ophthalmological Society) to provide their patients with cylinder-glasses in consideration of \$10 to \$15.

Now the question arises, is it in good form for members of a society that enjoys so enviable a reputation as does the American Ophthalmologist to trade in glasses?

To the beginner, the temptation to resplenish his purse with shekels by this sort of dickering may be hard to resist.

But, if yielded to, does he not surely descend towards the plane of the ubiquitous, itinerant, spectacle-selling "doctor," whose dicta, tediously repeated by his dupes, are not unfamiliar in our consulting rooms.

It is all in a nutshell. Two roads are before him—*facilis est descensus averni* and *noblesse oblige*. D. COGGIN.

Boston, March 10, 1887.

TO THE EDITOR:—In looking over Dr. Burnett's interesting and suggestive paper in the AMERICAN JOURNAL OF OPHTHALMOLOGY for January, 1887, I learn that M. Sous in his *Traité d'Optique*, Paris, 1881, doubts that by rotating a cylinder-lens about its cyl. axis we increase its refractive power. It would seem that the author could hardly have tried the experiment practically. However, in turning to the passage of his book in which the subject is referred to, it may be noticed that in the "demonstration" it is assumed that a ray parallel to the principal axis of a bi-convex lens and meeting the lens near its extreme periphery is refracted so as to pass through the principal focus of the lens; which assumption is inadmissible, as we know that of rays parallel to the principal axis only those quite near to it pass through the principal focus. Of course, the "demonstration" is invalid. Probably, by this time the author has noticed the lapsus.

Yours truly,

G. HAY.

EDITORIAL NOTICE.

THE INTERNATIONAL MEDICAL CONGRESS.

The following communication has just been issued by the president of the Section of Ophthalmology, and we hasten to bring it to the knowledge of our readers asking them at the same time to prepare papers for the occasion. These papers need not be confined to the topics mentioned below.—[Ed.]

WASHINGTON, D. C., Sept. 5, 1886.

MY DEAR DOCTOR—A very large delegation of the most conspicuous members of the medical profession from Europe will honor the International Medical Congress by their presence, and will take an active part in the proceedings. It is very much to be desired that the leading physicians of the United States should be present in force to welcome their colleagues from the old world, and also give them evidences, by the reading of papers, and by the discussion of subjects, that the various departments of medicine in this country are fully up to the European standard. You are cordially invited to become a member of the Section on Ophthalmology, and to prepare a paper to be used before the section. The meeting of the congress will not exceed five days. It promises to be one to be remembered by participants on account of the interests and pleasures of the meeting.

It will give me much pleasure to hear from you at an early date, with a notice of the subject of your paper.

Yours very truly,

JULIAN J. CHISOLM.

President of the Section of Ophthalmology.

EXTRACT FROM THE RULES OF THE CONGRESS.—Those who desire to present papers before the Section must advise the Secretaries by May 1, and furnish brief abstracts of their papers before June 1.

“No member shall be allowed to speak for more than ten minutes, with the exception of readers of papers and those who may introduce subjects for discussion, who may each occupy twenty minutes.”

Those who intend to be present at the sessions of the Section, and especially those who desire to take part in the discussions, will confer a favor by communicating with the President and Secretaries, who will be further gratified at receiving suggestions as to the work of the Section.

JULIAN J. CHISOLM, M.D.,

President of the Section.

Residence, 114 West Franklin St., Baltimore, Md.

Secretaries: Adolf Alt, M.D., 1519 Washington Ave., St. Louis, Mo.; Jos. A. White, M.D., 410 East Grace St., Richmond, Va.

NINTH INTERNATIONAL MEDICAL CONGRESS, WASHINGTON, September 5, 1887.—Section on Ophthalmology.—Scheme of Subjects for papers or for Discussion.

1. Antisepsis in Eye Surgery. How is it to be carried out? What part do microbes play in the development of eye diseases?

2. What are the advantages of very hot over very cold applications in the treatment of acute inflammations of the eye?

3. What are the reflex diseases of the eye, and the distant sources of irritation?

4. Is sight restored in tobacco amblyopia solely by stopping the use of tobacco, or by the administration of strychnia?

5. What part does malarial poisoning play in the development of eye diseases?

6. Is strabismus really dependent upon the refractive condition of the eye, or is it mainly a muscular defect coincident with certain anomalies of refraction? At how early an age should strabismus be corrected by operation? The advancement of Tenon's capsule.—What are its permanent effects?

7. The relative value of retinoscopy in the diagnosis of refraction cases? In the adjustment of glasses should the whole error of refraction, as revealed by atropia, be corrected; Do not the slight forms of astigmatism, one quarter of a dioptric, often cause as much annoyance, as do the higher grades, and do they not equally demand correction by cylinders?

8. The uses of the cautery in arresting progressive ulcerations of the cornea.

9. The value of eserine drops in checking the progress of glaucoma?

10. Has Jequirity solved the problem of trachoma? Does the crushing of trachomatous granules by pressure or scraping promise an advance in treatment over the sulphate of copper crystal?

11. What is the best method of operating for entropion?

12. Is abscision in staphyloma an operation scientifically established? What are the advantages of evisceration over extirpation of the eye-ball? Does optico-ciliary neurotomy sustain its position as a good substitute for enucleation? Is it safer to enucleate or to eviscerate panophthalmitic eyes? Conservative treatment of severe wounds of the eye-ball. Will iridectomy be abandoned in cataract extractions?

13. Under antisepsis can unripe cataracts, sufficiently advanced to destroy useful vision, be safely extracted? Is the introduction of antiseptic liquids into the anterior chamber, after cataract operations, a safe and useful procedure? What is the best method of caring for patients after cataract extractions? Can the eye not operated upon, in cataract and iridectomy cases, be left open with safety for the comfort of the

patient? Is the restraining treatment usually enforced after eye operations necessary?

14. How is detachment of the retina best cured?

Papers relating to topics not in this list will be equally received as a part of the work of the Section.

THE AMERICAN JOURNAL OF OPHTHALMOLOGY.

VOL. IV.

APRIL, 1887.

No. 4.

REPORT OF A CASE OF IRIDO-CHOROIDITIS WITH SYMPATHETIC IRRITATION OF THE FELLOW EYE.

BY H. CULBERTSON, M.D., ZANESVILLE, O.

ASSISTANT SURGEON U. S. ARMY, RETIRED.

Four years ago W. G., then a lad of 14 years of age, consulted me for keratitis and plastic iritis of the left eye. The pupil was occluded and there was synechia posterior. I do not recall his treatment, but he passed from my observation until July, 1886, when I found the cornea nebulous at points, also synechia anterior, general and radiated injection of the conjunctiva, new formed vessels in the cornea at points, the eyeball painful on pressure in the ciliary region with pains radiating over the forehead, on the side of the nose and in upper jaw on left side of face. The tension was normal. His pain was worse at night, but I could detect no signs of syphilis. His right eye now pained him, and he could not see perfectly with it and he saw motes floating before this eye, and there

was photophobia, and pressure in the ciliary region gave pain. Its pupil was active, the cornea clear, with some irregular injection of the conjunctiva, the lens and media were clear; but the retina and optic papilla were hyperæmic, and there was no disease of the choroid.

I advised enucleation of the left eye, which was done the following day. As has been my custom for ten years, the patient was placed under the continuous influence of morphine and chloral, to relieve the pain in the orbit and of the right eye, in this case. This was kept up for five days, when he no longer had pain.

No sutures were employed to close the capsule of Tenon, and the cavity of this capsule and the conjunctival cul-de-sacs were washed out several times daily with Panas' disinfectant fluid. Ice water was applied to the left eye. The room was darkened and the patient kept quietly in bed. Sympathetic inflammation did not result in the fellow eye, and the boy made a good recovery and now sees perfectly with the right eye. The left orbit was tender for several weeks after the operation, so that an artificial eye was not inserted for a month subsequent to the removal of the eyeball. He now wears the eye constantly and without inconvenience.

After removal the eyeball was placed in Müller's fluid for six weeks, then cleared out in an aqueous solution of chloral hydrate, grs. xx to 5i. It was then frozen and divided horizontally and antero-posteriorly, from the center of the apex of the cornea to 2 mm. above the optic nerve. A posterior segment was then made of the hemisphere containing the optic nerve, and this segment was again divided longitudinally through the optic papilla and nerve. These several sections were placed in celloidin until saturated, and then in a 70 per cent. solution of absolute alcohol. After this hardening process was completed, they were placed in a microtome, and thin sections made, and these were cleared in oil of cedar and mounted in glycerine. Figs. 7 and 8 are micro-photographs taken from corresponding slides prepared in this manner.

Microscopical examination of the specimens:

Fig. 7 does not show the details as well as *the* slide, when seen microscopically, and hence the appearances as seen with this instrument will be given and the figures employed to aid the description.

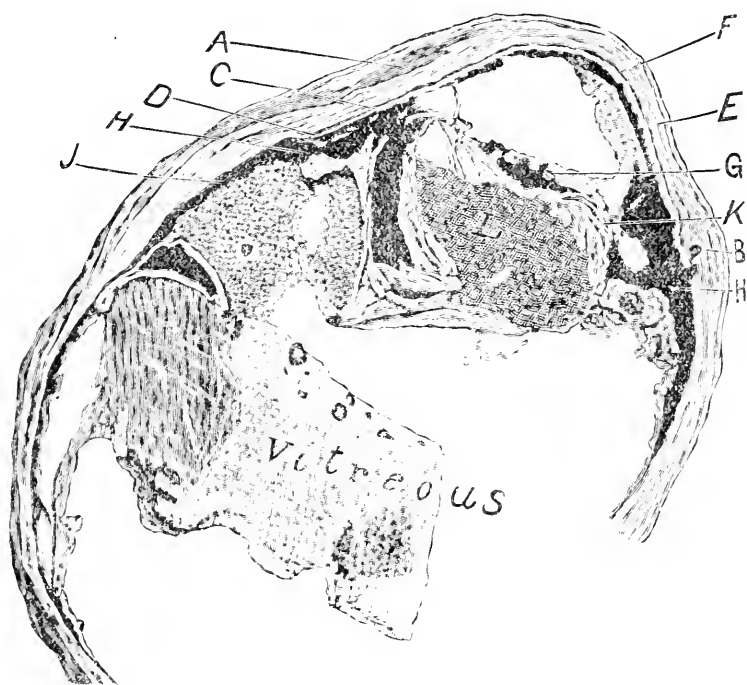


Fig. 7.

The fibres of the cornea are abnormally wavy, and its epithelium is lacking at points. The external elastic layer can be defined and it, the true cornea, and the epithelial layer are infiltrated with pigment and leucocytes at points. At A is seen quite a large deposit of pigment with separation of the fibres of the cornea, and at B another deposit, and about this, the internal elastic layer is pressed outward in an angular form. This latter deposit is in the region of Schlemm's canal on the right side. At D, Schlemm's canal is imperfectly

open, and there is a linear opening running from C to D. The internal elastic layer can be seen at F, and it is deeply infiltrated with pigment. The iris, E, adheres to the membrane of Descemet throughout its entire extent in this section, and the pupil is closed. At G are seen deposits of pigment, extending to the left, upon the anterior capsule of the lens, which no doubt indicate former synechia posterior, which have been separated when the iris was forcibly cast forward and became attached to the cornea by the flow of fluids from behind forwards during the progress of the disease.

The stroma of the iris is broken at points, and at some parts of this membrane portions are separated from the body of this structure. Again, at points the fibres project into the true cornea, crowding aside and pressing before such fibres the internal elastic layer. The anterior and posterior surfaces of the iris are very irregular in outline. At many points the pigment is wanting in this membrane, and here deformed leucocytes can be seen. The texture of the iris cannot be distinctly made out in the microscopic and hardened preparation.

The ciliary body is ruptured and portions of the ciliary processes are separated from the main body; the pigment is wanting at points in the processes and the entire ciliary body is infiltrated with pigment granules and deformed leucocytes. At some parts the fibres of this muscle can be seen, but their outlines are indistinct, and pigment is freely deposited among these fibres. The ciliary processes H. H. are adherent to the deformed capsule of the lens, and only a few of the fibres of the suspensory ligament can be seen, and these are found at points of rupture of the capsule of the lens, and in the area of which openings, the lens-fibres are seen directly applied to the ciliary body. There is no opening between the lens and ciliary processes shown in this preparation, Fig. 7., which would permit the transit of fluids from the vitreous to the anterior chamber. However in another specimen, taken from a lower section of this eye, there is a clear opening between the sclerotic, choroid, and ciliary body, into the anterior chamber of the eye, on the right side of said section, but no

such space is apparent on the left side of that specimen. This then is the channel of communication between the vitreous and anterior chambers. In this latter section the iris is shown to be adherent to the lens, but not to the cornea. In Fig. 7 at J the ciliary body is separated from the sclerotic on the left, but not so on right side. The lens capsule is indistinctly seen in Fig. 7., but is clearly shown under the microscope, and it surrounds the lens in distorted folds, sometimes applied against the lens substance, again separated from it. The lens, L, is deformed, and there are fractures through it. Its fibres can be made out readily, and among these are numerous leucocytes, granular matter, and not infrequent deposits of pigment in masses and granules. I am unable to detect any lens cells, probably from the effects of reagents employed in the preparation of the eye and from the results of the intra-ocular disease.

The vitreous body contained several deposits of blood, which were present when the frozen eye was divided. These were so large as to involve the central portion of *this* body. At the periphery of the vitreous, both in front and behind, there are seen connective tissue and fine elastic fibres. There are also seen a number of blood vessels, both veins and arteries; also deformed red and white corpuscles, and fine and coarse pigment deposits as well as epithelium. In one section the vitreous is separated from the choroid in its entire extent, some of the latter adhering to the vitreous and a portion to the sclerotic. The retina is carried with the vitreous. These details are not seen in Fig. 7, but are shown plainly by another section in my possession, while viewed under the microscope. The fibres of the sclerotic are wavy, and its stroma is infiltrated with pigment.

In one of these sections the retina is well shown. It is crowded forward nearly as far as the lens. The internal limiting layer is not shown, but the layer of optic nerve fibres, the ganglion cells, the internal and external molecular, the internal and external granular layers, the external limiting membrane (imperfectly), the layer of rods and cones and the pig-

ment layer (imperfectly) are seen. All these textures are injured histologically from the effects of the severe inflammation which involved the eye.

This disease seems to have been more active in the vitreous and choroid than in the retina. However, we find in the retina deposits of pigment, leucocytes, deformed red globules and epithelium.

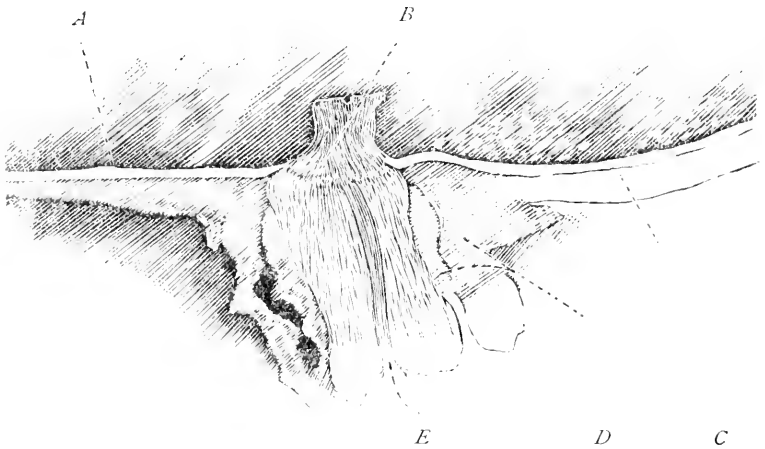


Fig. 8.

- A.* Choroid.
- B.* Optic nerve and cribriform fascia.
- C.* Sclerotic.
- D.* Optic nerve sheaths.
- E.* Central canal of the optic nerve.

Fig. 8 illustrates a vertical section through the optic nerve and its sheaths. It shows the optic papilla elevated above the level of the choroid, the upper extremity of which has been divided transversely to the axis of the optic nerve in obtaining the section. Beneath this nerve-head and on a level with the choroid is the cribriform fascia, darkened with the deposit of pigment. The optic nerve fibres are seen running distinctly throughout the nerve, and among these can be seen a

limited deposit of pigment granules, and at two points, in small masses; but there is no pigment or leucocytes in the central canal, or in those of the optic sheaths. I am not able to state that the central artery and vein of the optic nerve are pervious. These can, however, be seen beyond—behind—the level of the cribriform fascia. The contracted nerve-head has, I believe, closed the caliber of these vessels, at least in front of the cribriform fascia.

REMARKS.—This case presents an example of inflammation of all the interior parts of the eye, leading on to its destruction for visual purposes, the disease beginning in the cornea and iris and probably spreading to the choroid, and involving it, the vitreous, retina, the optic papilla and nerve. The case presents none of the features of glaucoma. On the contrary, the papilla is elevated instead of depressed, and there is no evidence of increased tension. The case is chronic in character, but towards its termination the eyeball becomes painful, involving the ophthalmic branches of the trifacial and other divisions of the fifth nerve. The morbid influence still continuing, the right eye became quite painful, intolerant of light, and its sight impaired. The left eyeball is removed, and the right eye recovers its functions. It is seen in this left eye that the long ciliary nerves still preserve their course unbroken, but unquestionably they are subjected to the influence of the choroiditis about them. So that in cornea, iris and in sclerotic these nerves are capable of being influenced by morbid agencies, and hence the manifestation of pain not only in this eye, but the fellow eye. There is no evidence in this case of transmission of morbid materials through the optic nerve or its central canal or external spaces.

CATARACT OPERATIONS IN NEW YORK.

BY FRANK TRESTER SMITH, B. S., M. D., CHATANOOGA, TENN.

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Until about a year ago the method of cataract operation which was almost universally accepted was that known as the "Von Graefe Modified Linear Extraction" with iridectomy. Of late some of our oculists have been operating without an iridectomy.

As there is considerable diversity in the details of the operations, the different methods are here described.

Dr. Knapp has been operating by a method which is essentially that of Panas, of Paris. The details are as follows:

The patient is seated in the operating chair, the doctor standing behind. Aenesthesia is produced by one or two instillations of a four per cent solution of cocaine. Antiseptic precautions are adhered to throughout. The hands of the operator and assistants are washed in Panas' fluid:

| | | | | | | |
|---|-----------------------|---|---|---|---|---------|
| R | Hydrargyri biniodidi, | - | - | - | - | 0.05 |
| | Alcoholis, | - | - | - | - | 20.00 |
| | Aquæ, | - | - | - | - | 1200.00 |

A solution of bichloride is sometimes used 1:5000. The integument around the eye is washed with soap and water, especial care being taken to cleanse the brows and lashes, the presence of hair forming a favorable nidus for the development of bacteria. The eye is then bathed with Panas' fluid, the upper lid being turned, and especial care being taken to reach the fornix and all parts of the conjunctiva. All instruments are

dipped into the biniodide solution, wiped dry and bright, then dipped into the fluid again just before being used. The patient is seated in the operating chair before the window, and, unless the day is very bright, the light is condensed on the eye with a reading glass held by an assistant. On dark days artificial light is used.

Everything being in readiness, the speculum having been introduced, the section is made with the narrow Von Graefe knife, the right hand being used for the right eye, the left for the left, the fixation forceps being held in the other hand. The puncture is made at the sclero-corneal margin a little above the horizontal meridian of the eye, the counter puncture at a corresponding point opposite. The section is completed by cutting upward with a sawing motion not quite parallel to the corneal margin. The upper part of the incision is about one-fourth the distance from the upper margin to the apex of the cornea. The incision includes about one-third of the cornea. Just before completing the section, the edge of the knife is turned forward so as to come out as near as possible at right angles to the surface of the cornea, thus providing for better coaptation of the edges of the wound, and avoiding a conjunctival flap. There is no iridectomy. The anterior capsule of the lens is thoroughly lacerated with the cystotome. The lens is pressed out in the usual manner, a hard rubber scoop in one hand pressing against the lower part of the cornea. After the delivery the speculum is removed, and the anterior chamber allowed to refill. The cortex is pressed out with the thumb through the lower lid, sometimes with a scoop stroking the cornea, or a small spatula may be introduced into the wound. Should the iris become engaged in the wound, it may be replaced by stroking the cornea. Should these efforts not be successful, the eye is closed for a few minutes until the aqueous accumulates, when they are repeated. Should it not be possible to replace the iris, an iridectomy would be necessary. When the iris is replaced, antiseptic fluid is injected into the wound, perhaps into the anterior chamber. In some cases a few drops of a one per cent so-

lution of eserine are instilled. Quite often the ability to count fingers is tested before bandaging the eye. The dressing is as follows: First a layer of antiseptic gauze covered with a one and a half per cent ointment of benzoate of mercury, then a layer of cotton wetted with antiseptic solution, then a layer of dry cotton. The other eye is dressed with cotton only. Over all a flannel roller is placed. Dr. Knapp has had forty-eight cases by this method. The results have been quite favorable. The vision is generally a little better than after the operation with an iridectomy. Iritis is more frequent, and is sometimes followed by adhesions. The central pupil is an advantage. He thinks it probable that this will be the operation of the future.¹

Dr. Agnew uses no speculum. The lids are held apart by the hand of the operator. The globe is held steady by placing a finger against it. This also serves to keep the aqueous from escaping under the conjunctiva which is sometimes pushed before the point of the knife. When the point of the knife is engaged in the opposite side the lids may be let go. Antisepsis with bichloride solution. Anæsthesia by means of cocaine. The section is made by entering the knife 1 mm. behind the clear cornea a little below the horizontal meridian. The counter-puncture lies at a corresponding point opposite. The section is downward, the apex being half way between the pupillary margin and the lower border of the cornea. This is the old Liebreich incision. No iridectomy is made. The anterior capsule is lacerated completely. The delivery is accomplished by pressure, first directly backward on the upper side of the cornea, then toward the center of the globe and downward. This manœuvre tilts the lens forward into the aperture, and then forces it out through the incision, the lower border of which is pressed backwards to facilitate the escape of the lens. After the delivery the anterior chamber is allowed to refill. The cortical substance is forced out by pressing through the lids. The

¹ For further particulars of Dr. Knapp's method of operating, statistics, etc., the reader is referred to Dr. Knapp's paper on the subject in the March number of the *Archives of Ophthalmology*, Vol. xvi, No. 1, pp. 54 to 71.—[Editor.]

dressing is as follows: The lids are first covered with vaseline, and absorbent cotton is placed over both eyes. A flannel roller is then applied, and over all a black shade tied with tapes. No drops are used.

By this method only two instruments are introduced into the eye. In some of the cases the visual results are perfect. The incision downward is easier to perform, but if an iridectomy should be necessary, it is not the most favorable location.

Dr. Noyes operates in selected cases without an iridectomy. The eye and surrounding integument are thoroughly bathed with antiseptic fluid, bichloride or boracic acid being used. The conjunctiva is washed with biniodide 1:20,000, or a one per cent solution of salt in water that has been boiled and filtered. The section involves two-fifths of the cornea. The puncture and counter-puncture are in the clear margin. The cut is made by depressing the handle of the knife, using the point of puncture as a fulcrum, then elevating the handle and cutting with the heel of the knife, avoiding a sawing motion as much as possible. No conjunctival flap. The anterior capsule is thoroughly lacerated. He sometimes dispenses with fixation. To deliver, pressure is made with small curettes or spatulæ, one above the edge of the wound, the other on the cornea. Sometimes the speculum is removed and pressure made through the lower lid. Generally the cortex is removed in this way. Should the iris prolapse, it is replaced with the spatula. Eserine, one grain to the ounce, is then dropped into the eye. During the operation the eye is irrigated more or less according to the amount of bleeding, the antiseptic being forced over the eye from a bulb-syringe by an assistant. After the extraction the vision is generally tested with fingers. In dressing the wound, a layer of cloth covered with vaseline is first placed over the closed lids, over this absorbent cotton is packed, then a flannel roller. The doctor thinks the method without an iridectomy of very limited application.

In performing an iridectomy the ball is fixed by an assistant. The cut is made by one clip, the scissors approaching from over the cornea instead of from the side, thus cutting from before backwards, making a small iridectomy.

Dr. Roosa, after introducing the speculum and fixing the eye below, makes the section upward with the Von Graefe knife, wholly in the cornea, comprising one half of its circumference. When the section is about half completed, the back of the knife is turned towards the lens. Some pressure is made backward in order to rupture the zonule of Zinn and thus dislocate the lens. The section is then completed. The lens is pressed through the incision. No iridectomy is performed. This brings the lens out in its capsule and leaves a clear central pupil, obviating the necessity of a secondary operation, and producing the best visual results. This method is like Pagenstecher's in that the capsule is removed with the lens, but the *modus operandi* is essentially different. In some cases it has been found necessary to perform an iridectomy. The doctor complains that none of his assistants adopt this method.

Dr. Pomeroy thinks the operation of the future is without an iridectomy. His idea is to use a modified Beer's knife, the blade to correspond in width to the width of the section. He has had six operations without an iridectomy with satisfactory results.

Dr. R. H. Derby operates only by the "Von Graefe Modified Linear Peripheral Method." This, he thinks, is the standard operation. When any superior method is demonstrated it will be time to adopt it.

Dr. Gruening reported, at a meeting of the New York Ophthalmological Society, four cases operated on without an iridectomy with very good results and smooth healing. At a later meeting he reported four more cases, in every one of which there was some complication due to the mode of operating.

In looking over the whole subject, it would seem that there is a wide difference of opinion in reference to the relative value of the different operations. It is generally conceded that to operate with an iridectomy is as safe as any method that has been suggested. The various other operations are still on trial. It will take some time to determine their value. One would naturally think that Von Graefe and other eminent ophthalmologists knew what they were about, when they aban-

done the method without an iridectomy. The main objection to the latter operation is the tendency to iritis after the operation. This has been reported by most observers. With this is the danger of adhesions to the capsule. There is also danger of prolapse of the iris. This has occurred in some cases several days after the operation. The method that gives the best average results is the one that commends itself to conservative surgeons, not the one that is the most brilliant in a minority or even in a majority of cases. If in a minority, the effects are below the average by the other method. It is better that ninety-five per cent should be able to see to get about than that seventy-five per cent should be able to read the finest print and twenty per cent not be able to find their way. Judged on these principles the von Graefe method seems to hold its place as the standard operation. By this method the best operators lost two or three per cent by suppurative processes. It can hardly be expected that these results can be excelled. If they can be equalled by any method that leaves the iris intact, it will be an improvement. So far the number of cases operated on is too small to form any reliable conclusions, and the matter must be considered *sub judice*. The methods of removing the lens in the capsule, heretofore proposed, have never received any considerable support from ophthalmic surgeons.

By the various new methods it is hoped to preserve the iris intact with a clear central pupil. This will give a better visual result, and, if it can be done safely, will be of immense advantage to our patients.

CHANGES IN THE FUNDUS OF THE EYE IMMEDIATELY AFTER DEATH.

BY LUCIEN HOWE, M.D., BUFFALO.

The circumstances which attend a death bed are ordinarily of such a nature as to render exact observations difficult. For this reason I have less hesitation than I would otherwise, in detailing a single case in which I had an opportunity of watching the changes in the fundus of the eye, immediately after dissolution.

When making my morning visit at the Franciscan Hospital, Pine street, on June 27, 1880, it happened that one of the patients in the general ward was in a moribund condition. This was a man about 54 years of age, who suffered from phthisis pulmonalis. To avoid the depressing effect of his death upon other patients he was removed to a smaller room which was properly darkened.

My observation began at twenty minutes past four. At that time the patient was totally unconscious; no pulse at wrist, heart beat at 110, respiration laboring at 28 per minute.

The eyes were upturned and immovable; cornea clear, pupils slightly dilated. The ophthalmoscope gave the usual reflex from the fundus of the eye, but all the features of the retina could not be clearly distinguished. A solution of atropia, two grains to the ounce, was therefore applied.

4:45 P. M.—Respiration irregular and gasping. No pulse at wrist. Heart beating feebly at 120. The left pupil now begins to dilate, and in the inverted image the features of the retina are as follows: color normal; outline of nerve indistinct; vessels normal; no pulsation of them visible.

4:50 P. M.—Respiration slower, accompanied by a peculiar noise in the throat.

4:51 P. M.—Retina apparently a little paler. Respiration gasping at 18 per minute.

4:55 P. M.—After a cessation of respiration for fully fifteen seconds patient made one deep inspiration. The accompanying expiration lasted an unusually long while, and then ceased. The heart's action had now also stopped and the patient was dead. No change in the appearance of retina.

4:57 P. M.—Retina same.

5:01 P. M.—The edge of papilla which before was indistinct, now clearer, and the entire fundus paler.

5:03 P. M.—Same as at 5:01.

5:07 P. M.—Vessels not clear on papilla.

5:08 P. M.—Whitish lines across the pupil in every direction, rendering a clear view of the fundus impossible, but the entire reflex much whiter.

5:09 P. M.—Oblique illumination shows the cornea to be thrown into folds as if half collapsed. Tension of globe normal.

5:12 P. M.—Right eye in the same condition as left.

5:20 P. M.—[About]—The day light having been admitted to the room, the reflex is almost white, but it is impossible to distinguish the different features of the retina.

In spite of the long time that has elapsed I have had no equally good opportunity to corroborate this sequence of changes by similar observations, still it is pertinent to mention that I examined ophthalmoscopically the eyes of a murderer, Carl Manke, about twenty-eight minutes after the drop fell: The condition presented was in every way similar to that in the case narrated at the end of twenty minutes after death. There was no perceptible rupture of the lens, as has been described in cases of hanging, by Dr. Dyer, of Pittsburg; but the wrinkling of the cornea, which was perceptible only on oblique illumination, could easily have been mistaken for such a fracture of the lens.

An interesting question arises in this connection as to the length of time the visual purple persists after death in the hu-

man subject. Of course the light ordinarily employed would itself hasten the bleaching, but with the aid of a sodium flame properly arranged, it would be possible to study the changes quite satisfactorily.

THE ORTHOPÆDIC METHOD OF TREATING PARALYSIS OF THE OCULAR MUSCLES.

BY ADOLF ALT, M. D.

In the November number of *Zehender's Monatsblaetter fuer Augenheilkunde* of 1877 Prof. J. Michel, now of the University of Wuerzburg, for the first time advised an orthopædic method of treating paralysis of the ocular muscles. He described this method in the following words: "The conjunctiva near the corneo-scleral margin and over the insertion of the paralyzed muscle on the eyeball being grasped with the common fixation-forceps, the eyeball is dragged in the direction of the sphere of function of the paralyzed muscle and as far as possible beyond its ordinary limit of contraction, then again backwards. These movements back and forth are made for about two minutes at the time. The effect of this manipulation is greatest and even astonishing right at once. The addition, the gain in the faculty of contraction is at least one and a half millimetres. The effect is gradually reduced, so as to equal on an average a prism of from 12° to 16° about one hour after this manipulation. * * * One such manipulation every day seems to be sufficient. * * *

The main advantages of this treatment are: 1. The elimination of the action of the antagonistic muscle. 2. The shortening of the necessary period of treatment." * * *

Although it might appear from the foregoing that Michel wanted to substitute this orthopædic method of treatment as a superior one for the methods formerly in use, he states in his *Compendium on Ophthalmology*¹ that "in a number of cases

¹Lehrbuch der Augenheilkunde von Dr. Julius Michel, Wiesbaden, 1884, pp. 107 etc.

of paralysis the orthopædic method by means of passive movements may be used with advantage." And, further on, "both methods, the electrical and the orthopædic one, are to be used conjointly."

From this it appears that the orthopædic method alone has not proven all that might have been expected after his first communication. This has also been my experience. Yet, I am satisfied that the orthopædic method by passive movements is a valuable one in the treatment of paralysis of the ocular muscles, and that it should always be tried in conjunction with other treatments which may be appropriate in the case in hand. Before we had cocaine, the pain caused by this treatment was enough to frighten some patients away. With cocaine the manipulation is far from being painless, especially in its after-effects, but it is so much less so than in former years, that most patients willingly submit to it.

In the following, a few cases in which the orthopædic method was applied, are detailed.

CASE I. H. W. C. L., æt. 49, has had syphilis when a young man. Had stricture of the right nasal duct. Complained of weak eyes for several years. Double images had gradually developed to an alarming extent during the last four months. When he consulted me I found a moderate ptosis of the right upper lid and paralysis of the rectus superior and the rectus externus of the same eye. Fundus and vision were normal. He complained of no other symptom but headache. I ordered large doses of iodide of potassium, and treated him with electricity. The result of this treatment being nil, except with regard to the ptosis, which disappeared, I began with the orthopædical treatment by passive movements of the affected muscle. Although this treatment was persisted in for two months, no improvement took place. About a year later on, as the paralysis remained unchanged, I proposed tenotomy, but the patient would not consent.

CASE II. B. B., æt. 44, consulted me on account of double vision which he had felt coming on a week before he saw me. I found paralysis of the left abducens muscle. The knee-reflex

was decidedly exaggerated. Both optic nerves were pale and the retinal arteries rather thin. Suspecting a beginning spinal affection, I sent him Dr. to Bremer, of this city, for a general examination of his nervous apparatus. However, nothing definite was elucidated, beyond the probability of a coming spinal trouble. He most emphatically denied ever having had any syphilitic affection. He was given the iodide of potassium in increasing doses, and I treated the paralyzed muscle by passive movements. After eleven such treatments the activity of the muscle was perfectly re-established. I do not know anything of the further history of the patient.

CASE III. Mrs. M. M., æt. 41, came to consult me three weeks after having had a severe accident. While going down the cellar-stairs she slipped, and fell so unfortunately that she found herself hanging on a large meat-hook fastened in the wall, which had entered the orbit under the right upper lid. Severe hæmorrhage and inflammation followed, and when the latter had subsided, she could not raise the lid voluntarily, and saw double, when lifting it with her hand. I found a complete inactivity of the levator palpebræ superioris; the lid could be moved slightly, however, by the action of the frontalis muscle. There was also a restriction of the action of both the rectus superior and rectus internus. A stellated scar on the conjunctiva bulbi marked the entrance of the hook. Passive movements, massage and electricity proved all useless, although continued for two months. No change has since occurred. The operative measures which were proposed as a last resort, were not consented to by the patient.

CASE IV. S. L. æt. 29, consulted me about double vision which he had noticed for about one week. I found complete paralysis of the right external rectus. He had never had syphilis. The patellar reflex was considerably exaggerated on the left side. He confessed continued excess in the sexual sphere. I at first advised cold douches down the back, followed by friction, and used the faradic and constant current. No improvement being noticeable after one week, I proceeded to the passive movements, and gave him besides some iodide

of sodium. By this treatment he improved at once, and in five weeks, when he left the city, barely a trace of the former trouble could be noticed.

CASE V. A. K. æt. 51, was sent to me in consultation on account of double vision, which he noticed for the first time on the day before, when getting up in the morning. He had been infected with syphilis about a year previously, and he had had skin symptoms six weeks after the primary sore. I found ptosis of the left upper lid, and paralysis of the internal rectus and paresis of the superior rectus of the same eye. He had been under antisyphilitic treatment of some kind almost throughout the year since he had been infected. He was ordered large doses of iodide of sodium and inunctions of the 20 per cent. oleate of mercury. To these I added at once passive movements of the internal rectus. The pathological symptoms gradually disappeared under this treatment in two months' time. In the second month I also applied the constant current. The ptosis disappeared first, the paralysis of the internal rectus last.

TRANSLATION.

In the January number of the *Archives d' Ophtalmologie*, Panas has an interesting paper on "Considerations on the Pathogeny of the So-called Serous Cysts of the Orbit, Occasioned by a Recent Observation." In this paper he gives the minute anatomy of a bilobular cyst he removed from the left orbit of a little girl æt. 12 years. As the results he has come to, appear to us of importance, we give here the résumé made at the end of his paper.

"The study of minute anatomy which precedes shows undoubtedly that we had here really to deal with a bilobular cyst, formed by a membranous wall containing acinous muciparous glands, with excretory canals lined with cylindric epithelial cells. Some mucus, somewhat modified by the admixture of elements of the blood, at least in the largest and probably the oldest of the two sacs, was all the cyst contained.

From this we have no other explanation than, that the formation of the cyst under consideration was in reality due to the fœtal incarceration of some of the mucous membrane of the fossæ nasales and the sinus, since it represents that structure almost exactly. This cannot be objected to on the ground that the epithelium, although it is cylindric, has no vibrating cilia, since the epithelium of the lachrymal duct and sac, although derived from the same mucous membranè, has none either.

The most characteristic condition is, however, the presence of numerous acinous glands similar to those of the mucous membrane, and added to this as the only contents of the cyst, a pure viscid mucus, which has become coagulated by the hardening fluids, like normal albumen.

Viewing now the topography of this cyst and its relations

with the walls of the orbit, we will come to the same conclusion, that it is of a dermo-mucous origin.

In fact, we know that this cyst and all those we find reported, and which are analogous to it, are situated invariably in the lower inner portion of the orbit, that is, just in that portion which is in connection with the mucous membrane of the fossæ nasales and the maxillary sinus. Is it not, therefore, infinitely probable that the one is derived from the other, the more so, since all the dermoid tumors of the orbit are derived from the external integument of the embryo, abnormally incarcerated, and later on separated from the derma from which they took their origin? We do not see any possibility to doubt this.

Let us see what the observations of others teach us, which, usually incomplete, were published before ours, and which we find here and there in the scientific publications.

In the case of orbital teratoma, observed by Boeer and Weigert, it is stated that "the cystic sacs in the substance examined, are lined with a ciliated cylindric epithelium, and that they furthermore possessed mucous glands."

In Kundrat's observation it was a colobomatous eye grown together with a cystic substance. The latter consisted of an immense number of small cysts, lined with a cylindric epithelium. Besides, there was, as in our case, a small quantity of cartilage.

Undoubtedly we could multiply these citations, but all the observations made before the time of histological studies and those the examination of which was made in an incomplete manner, or rendered defective by the bad conservation of the specimen, could not be of much value to our proposition, that is, the demonstration of the fact that these cysts are of a naso-mucous origin.

The future will fill the gap and our observation is only the beginning.

Talko and Hoyer already, when studying the microphthalmus with formation of cysts, have upheld the idea that the

cyst was independent of the eyeball and interfered with its growth.

Others, and among them our learned friend and former pupil, Van Duyse, have felt themselves authorized to think, that the cyst sprang from the eyeball, the evolution of which, in an unaccountable manner, had been interfered with. In proof of this, they mentioned that they found certain elements of the choroid and retina within the cyst. But why should it appear astonishing that a cyst derived from the nasal fossa and growing largely within the orbit before the ocular vesicle is closed, should grow together with it, not only so as to interfere with its development, but so as to exchange elements with it?

Is this not the way it happens in the ovary in which, by the side of a dermoid cyst we find serous cysts coming from the female organ, the evolution of which has been seriously interfered with by the dermoid?

By all these reasons we are tempted to side with Talko and Hoyer, as regards the ocular teratomata, and this gives a much wider range to the doctrine of the mucous origin of the naso-orbital cysts than may at first appear.

When once this pathogeny of the so-called serous cysts of the orbit will be finally accepted, the dense obscurity which now covers this subject will be removed, and we will have two well defined classes of congenital cysts of the orbit.

One will comprise the dermoid cysts, that is, those due to an incarceration of the outer integuments; the other, the mucoid cysts, derived from the incarceration of the mucous membrane of the air-passages in the orbit.

Whether such cysts are small or big, simple or compound, pure or changed in character, in communication with the neighboring cavities or not, arrest the development of the eyeball or not,—all these can only be questions of degree and time in the development of the mucoid cysts of the orbit and nothing more.

The following report on *Cataract Produced by Naphtaline* was made to the Society of Biology of Paris by Bouchard and Charrin at its meeting, December 18, 1886, and is translated from the *Revue clinique d'Oculistique*.

"Last June we announced to the Academy of Medicine that naphthaline brought into the alimentary canal of rabbits in certain doses would cause the formation of cataract. Since then we have proceeded with these experiments in the laboratory of general pathology of the faculty of medicine; and the fact has again been established. We complete to-day our first communication by some new details.

If we cease to administer the naphthaline as soon as the cataract begins to make its appearance, this lesion usually progresses continually, and the lens becomes more and more dim. Both eyes are generally attacked in an almost similar manner. There are, however, some exceptions to this rule, as in this rabbit which we show here to the society.

The cataract appears in different cases at a different time; yet, it is but rarely not yet visible on the twentieth or twenty-fifth day after the beginning of the experiment.

Naphthaline has been administered in doses of one and a half or two grammes (from about twenty to thirty grains) a day, mixed with glycerine. Glycerine alone does not produce a similar lesion. If we calculate according to the weight, our rabbits weighing on an average two kilogrammes (four pounds), these doses for a man weighing seventy kilogrammes (140 pounds) would be equal to about thirty-five grammes (about one ounce and seventy-five grains).

Many animals during the experiment lose flesh, but usually they do not die, but soon get fat again after the administration of naphthaline has ceased. This white rabbit which we show to the society weighed 1,990 grammes (almost four pounds) on May 26, 1886, he weighs now more than three kilogrammes (six pounds) and you can see that he has a complete double cataract.

Other substances have been experimented with in order to produce cataract. The results were uniformly negative. These substances were the following ones: Naphthol (*a.* and *z.*), naphthylsulphite of sodium (A. and B.), naphthylamine, monosulphonaphthol, phenate of sodium, phenic acid.

The question naturally arises, why does naphthaline produce

cataract in the rabbit, when introduced into the alimentary canal? We can so far answer it only by a hypothesis. When introduced into the organism of the rabbit, naphthaline becomes combined with sulphites. It is found in a small quantity in the urine, but not as naphthaline, it is then naphtylsulphite (M. Rosenstiehl). We tried to find out whether this agent acted on the crystalline lens as naphthaline or as naphtylsulphite of sodium. Since these naphtylsulphites (A. and B.) are very soluble, it is easy to verify this hypothesis experimentally. These salts, even in very considerable doses, exert no influence on the nutrition of the lens. We, are therefore, induced to question whether naphthaline does not cause the changes in the lens by the fact, that it combines with the sulphur, and therefore acts on the globuline in a chemical way, in withdrawing from it a portion of the sulphur, it normally contains. In this case it would be necessary to see whether the other agents which combine themselves in the human economy with sulphur also produce a disturbance in the nutrition of the crystalline lens. For this purpose we have so far only used the phenate of sodium and the phenic acid. Although we have administered these substances for three weeks, the results obtained were absolutely negative.

It does, however, not seem to us as if we had, therefore, to abandon our hypothesis altogether, since we were forced on account of the very poisonous character of the phenate of sodium and the phenic acid, to give but very small doses. It may be, that this production of cataract will be of some practical consequence in the hands of ophthalmologists (artificial ripening of cataract, studies with regard to the nutrition of the lens, experimental extraction of the cataract in animals, etc.)."

The following article by Prof. A. Eulenburg in Berlin, on *Episcleral Faradization and Galvanization of the Ocular Muscles* is taken from Hirschberg's *Centralblatt fuer prakt. Augenheilkde.*

The episcleral, so-called direct, method of electric irritation of the ocular muscles, although used among others by Fieber,

Gozzini, Rosenthal, Brudenell Carter (after operations for strabismus) and strongly advocated by me already seventeen years ago, has so far not been able to gain favor more generally. In electro-therapeutical as well as in ophthalmic reports we meet almost universally with the "indirect" or "percutaneous" (more correctly transpalpebral) method, which by Benedikt, without apparent reason, has been described as the "reflex-irritation" of the ocular muscles. The episcleral method on the other hand is either not mentioned at all, or not accepted on account of the erroneous idea of painfulness and a too powerful irritation of the conjunctiva, and, since it is thought, that we can get along as well without it. This prevailing opinion has again been promulgated more recently by von Ziemssen (5th edition of his "Electricity in Medicine" 1887, p. 427).

The percutaneous method is, however, not at all satisfactory; on the contrary, its results are very imperfect, as probably most of those who *ex-officio* practice electro-therapeutics in paralysis of the ocular muscles, can testify. The direct method moreover, is not at all as painful, as it is usually stated, if it is applied in a proper manner, and, furthermore, we have had in cocaine for the last two and a half years an excellent, and almost infallible remedy, by means of which we can, through the anæsthesia of the whole of the surface of the eyeball, reduce the local pain due to episcleral electrization to almost *nil*.

Since this action of cocaine has become known I use, according to Hirschberg's advice, the episcleral faradization and galvanization always in this way: I first instill a large quantity of a cocaine solution (2 to 5%) into the conjunctival sac, and five minutes afterwards, when the anæsthesia of the cornea and conjunctiva is already established, I instill it a second time in the same manner. Then the electrode for the ocular muscle which I shall describe presently (with the circuit not closed), is brought rapidly into place, while the indifferent electrode in the shape of a large round plate (fifty square centimetres) is applied to the sternum or held in the hand. The current is gradually raised to the desired intensity, which in

galvanization may be directly ascertained from the absolute galvanometer. The electrode for the ocular muscles (made by W. A. Hirschmann, Berlin) consists of a pliable oval platinum plate, eight millimetres long and six wide, which is attached to a narrow rod, twenty millimetres long, which is held in a brass grip. This electrode has a handle, ten centimetres long, to which the conducting wire-rope is attached by means of a screw. It is furthermore arranged in such a manner, that by pressing down a knob, which ordinarily is held raised by a spiral spring, the metallic contact and the closing of the circuit may be produced for any desired period.

With this instrument the sessions lasted under cocaine anæsthesia from one to two minutes, and I have not seen any bad consequences from using induced currents which were strong enough to produce contractions of the orbicularis palpebrarum, or even of the more distant facial muscles (frontalis and corrugator). During galvanization (the anode on the eyeball) the intensity of the current, as measured by means of Hirschmann's astatic absolute vertical galvanometer, was, as a rule, one half to one millampère; in some cases it was even more, so that I often produced a galvano-optical reaction when increasing or decreasing the current.

In spite of this relatively large intensity and density of the current (D with $\frac{1}{2}$ millampère intensity = 1) I was to my astonishment never able, even when the muscular apparatus was perfectly healthy, to produce visible excursions of the eyeball in the direction of the muscle which was directly irritated by means of the local application of the faradic or galvanic current. This negative result was so constant that I must express a decided doubt in the several adverse statements of older authors, and am forced to consider them based on errors of observation which are probably due to the restless and irregular movements of the eyeball when irritated without anæsthesia. The non-success of this episcleral irritation, I further think, is easily explained by the physical conditions (of conduction and resistance).

It is well known that the amount of water in the eyeball

when compared with that in the neighboring tissues, is very large. According to Gorup-Besanez, the amount of water in the eyeball (dried by 110° Celsius) is 90%, while that in the neighboring connective and muscular tissues is only 71.5%. The resistance of the eyeball, as shown by von Ziemssen, is about $2\frac{1}{2}$ times smaller than that of the muscle, and only slightly smaller than that of fresh, moist brain tissue.

It is, therefore, natural that the current after passing through the sclerotic will especially spread in the moist tissues of the eyeball, while the muscles, containing so much less water, can only be reached by weak side-currents. To this we must add that the position of the ocular muscles is especially unfavorable to electrization, since on account of their site and the manner of their attachment it is probable, that only the tendinous portions lying in Tenon's capsule can be reached by the current while of sufficient density, and not those muscular fibres which run along the walls of the orbit and to the posterior pole of the eyeball, nor much less their motor nerves at their entrance into these muscles.

In this way it is impossible to hope for an especial diagnostic and prognostic usefulness of the direct irritation of the ocular muscles as explorative means in the paralysis of these muscles. Yet, this method is to be given the decided preference as a therapeutic means in peripheral ophthalmoplegia, since it is in better accord than the percutaneous method with the generally adopted principle, to apply the electrization as much as possible *in loco morbi*. Its effect, moreover, can easily be proven by the usual criteria, the increase of absolute motility and the decrease in the size of the field in which the double images appear after the session.

I have also, aside from the cases of more recent and intermittent paralyzes of the oculomotor and abducens nerves, seen favorable results from this method in cases of copiopia in neurasthenic and hysterical individuals.

DEATH OF HOFRATH PROF. FERDINAND VON ARLT.

The 7th of March, 1887, Ferdinand von Arlt, the Nestor of ophthalmology, the justly celebrated teacher and brilliant operator died of gangrene of the leg.

THE INTERNATIONAL MEDICAL CONGRESS.

The following communication is received from the Committee of Arrangements and published for the information of persons desiring to attend the Ninth Meeting of the International Medical Congress in Washington, D. C., in 1887.

RATES OF TRANSPORTATION.

Red Star Line, \$100; Antwerp to New York and return.
Inman Line, \$100; Liverpool to New York and return.
Hamburg Line, \$90; Hamburg to New York and return.
Royal Netherlands, \$80; Amsterdam to New York and return.

North German Lloyd Line, \$187.50; Bremen to New York and return.

Same rates are allowed for the families of members.

Cunard Line, 10 per cent. reduction for members of the Congress only.

HOTEL RATES IN WASHINGTON.

Arlington Hotel, from \$3 to \$3.50 per day.

Riggs House, from \$3 to \$3.50 per day.

Willard's Hotel, from \$3 to \$3.50 per day.

Metropolitan Hotel, \$3 per day.

National Hotel, \$3 per day.

Other Hotels conducted on European style will furnish rooms at \$1 to \$2 a day. Good lodging houses will also furnish rooms from \$1 to \$1.50 per day.

Proper accommodations have been secured for the meeting places of the Congress and its Sections.

Transportation within the limits of the United States has not yet been determined upon, but will soon be made public. Particulars of the plan of entertainments will be published in the official programme, and all notices will be published in due time.

A. Y. P. GARNETT, *Chairman,*

C. H. A. KLEINSCHMIDT, *Secretary.*

SECTION OF OPHTHALMOLOGY.

We are glad to be able to announce to our readers that the number of prominent men who have promised to take part in the work of the Section of Ophthalmology of the coming International is growing steadily.

Among those who are coming from Europe and have accepted positions as vice-presidents are: Dr. Hirschberg, Berlin; Dr. DeWecker, Paris; Dr. Landolt, Paris; Dr. Mauthner, Vienna, etc. From England, Drs. Brailey, Powers and Hewetson.

Among the American ophthalmologists who hold honorable positions in our section or have promised attendance and papers are the following well known gentlemen:

Drs. Hotz, Howe, Heyl, Keyser, Calhoun, Reynolds, Baldwin, Ferrer, Connor, Gardner, Marmion, Minor, Sanders, Fryer, Thompson, Sinclair, Smith, and a number of others.

The success of the Section of Ophthalmology is thereby abundantly assured.

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A CASE OF PARTIAL TRICHIASIS RELIEVED BY STELLWAG'S METHOD OF REVERS- ING AND REPLANTING THE CILIARY BORDER.

BY F. C. HOTZ, M. D., CHICAGO, ILL.

[Reported at the Chicago Society of Ophthalmology and Otology, April 12.]

The feasibility of skin-grafting, which has been successfully demonstrated by numerous instances, suggested to Prof. Stellwag a new way of operating for trichiasis. His method is as original as it is simple; but I believe it is as yet little known among oculists, as he published it in a medical periodical¹ not often read by specialists.

The first steps of the operation are the same as in the operation for scalping; the lid border is split into an anterior and posterior leaf, and a transverse incision parallel to the lid border and 4 to 5 millimeters from it is made from canthus to canthus. But at each canthus the direction of this incision is so changed that there it joins the ends of the first cut by which the lid border has been split. In this way a long and

¹Allgemeine Wiener Mediz. Zeitschrift, 1883.

narrow flap is obtained which contains all the eye-lashes. This flap is completely dissected off; but instead of being thrown away, as in scalping, it is, after all bleeding of the wound has ceased, put back in its place again, but with its edges reversed so that the originally upper edge is now the lower edge and *vice versa*. By this reversion of the flap the direction of the eyelashes is not only thoroughly changed, so as to turn them away from the eyeball, but they are also removed a little distance from the edge of the lid by the interposition of a narrow strip of smooth skin which serves as a sort of substitute for the obliterated intermarginal border and effectually prevents the eyelashes from ever coming again in contact with the cornea.

At a first glance this operation seems to have at last solved the vexed problem of devising a simple and rational method for the relief of trichiasis. But when we consider the possibility that the replanted flap may mortify—and we know very slight disturbances can cause it—and when we learn from Prof. Stellwag that in some cases the eyelashes dropped out and did not grow again; and that in the other cases he was not sure whether they remained, then the operation shows a less promising and inviting aspect. For, if the flap mortifies or the eyelashes disappear, the final result would be nothing more nor less than what the old operation of scalping has accomplished.

These considerations have prevented me from trying this operation in cases of total trichiasis. But, when a short time ago a case of partial trichiasis of the lower eyelid came under my care at the eye and ear infirmary, I concluded to try Stellwag's operation, because if it should fail or the eyelashes come out, the disfiguration would scarcely be perceptible in this case.

The patient, æt. 31, was admitted on February 10, and the house-book shows that one year ago the lid of his right eye was operated on for trichiasis by Dr. Montgomery, applying his transverse ligature described by him at the June meeting of last year. The final result of this operation was exactly

what I should expect from a transverse ligature, to-wit, the lateral portions of the lid border were everted; but the central portion was not affected by the contracture of the ligated tissues; there the eyelashes were still brushing over the cornea, causing a continued irritation of the eye and pannus of the lower half of the cornea. On February 17 I performed the operation under strictly antiseptic precautions; the instruments were kept in a five per cent. solution of carbolic acid; the eyelids were thoroughly washed with solution of sublimate (1 to 5,000) and during the operation the wound was continuously irrigated with warm sublimate (1 to 10,000). I followed strictly and verbatim the directions as Stellwag gave them in his paper. I split the lid border with an iridectomy knife as far as the cilia were inverted; from each end of this incision a vertical cut, 4 to 5 millimeters long, was made from the lid border downwards, and the lower ends of these incisions were united by a transverse incision. Thus a rectangular flap, 6 by 4 or 5 millimeters, was mapped out whose upper edge contained all the inverted eyelashes. This flap was completely detached and packed between cloth which was constantly sprinkled with a warm solution of sublimate. The wound was then carefully scrutinized for bulbs of cilia which might have been left in splitting the lid; but none could be found. The blood oozed out quite freely, and it was the most tedious part of the operation to wait until the bleeding ceased. But at last it ceased, and after the wound was carefully cleansed of all coagulated blood the flap was placed back upon it with the eyelashes turned downwards and the originally lower edge of the flap joined to the lid border. When the flap was nicely adjusted, the lids were closed and once more irrigated with sublimate. A piece of aseptic tinfoil coated with vaseline was placed upon the lids and a binocular bandage applied. This dressing was not disturbed for three days, when it was changed (February 20) I found the flap perfectly united with the lid; but I continued the binocular bandage two days longer; and then the right eye alone was kept bandaged for two days more. February 24, however, the flap

was found so firmly adherent and its union with the surrounding skin so perfect that the protective bandage could be dispensed with.

So far the operation was a perfect success; but the lid showed a strange appearance inasmuch as the transplanted eye-lashes in the centre of the lid were 4 millimetres lower than the ciliary line of the lateral portions. I hoped, however, the shrinkage of the flap which we always have to expect, would gradually bring those eyelashes back into the line; and anxious to watch the further changes, I kept the patient under observation a whole month. The anticipated shrinkage took place and reduced the size of the flap one-half; but in the meanwhile the eyelashes dropped out and soon there were only two eyelashes left of a dozen or more, and when the patient was discharged (March 24) those two solitary eyelashes were the only landmarks to remind us that once there was a luxuriant growth of eyelashes in that piece of the eyelid.

The loss of the eyelashes being limited in this case to a small area, it has not caused any appreciable blemish; but should the same result follow the reversion of the whole ciliary border of the upper we must concede that it would badly mar the appearance of the eyelid.

It would, of course, be an unpardonable presumption should I pass judgment on the merits of Stellwag's operation on the strength of one single observation. But, inasmuch as the author himself has admitted that his operation was often fatal to the growth of the eyelashes, I do not think his method can ever win the general recognition of ophthalmic surgeons; for I am of the opinion that any new operation for trichiasis destined to supplant our present methods, must not only permanently relieve the patient of his trouble, but also remove the deformity of the lid border; it must not only avoid the possibility or probability of mutilating the eyelid, but should restore as nearly as possible the natural appearance of the lid border.

SIMPLE METHODS OF FINDING THE AXIS OF A PRISM.

BY WARD A. HOLDEN, A. B., M. D., CINCINNATI, O.

It is often desirable when prisms have been prescribed, to find whether the optician has placed them in the frames with the axis at the proper angle, and there is often doubt as to the correctness of the axis mark on test case prisms. It is not surprising that the optician marks prisms incorrectly, when we see the rough methods of finding the axis that he uses. Some opticians place a prism in the angle of a hinged rule, so that one leg of the rule touches each surface, of the prism, and then turn the prism to the point where it spreads the legs of the rule furthest apart, and here mark the axis along the edge of the rule. And they regard as satisfactory such rough tests as this.

It is proposed here to glance over some simple practical methods of finding the axis of a prism.

I. A prism when looked through produces a false image displaced in the direction of the summit of the prism. If, both eyes being open, a prism is held before one eye, two images are seen, one true and one displaced, and a line between similar points in the two images corresponds to the axis of the prism. When a line is observed and the prism is rotated, at some point the true and false images of the line become fused at their near ends and continuous. The false image here is displaced, but it is displaced exactly in the direction of the line, so the line is not broken, and this line corresponds to the axis of the prism. A card may be placed half way across the prism so that its edge coincides with the line observed, and along this edge the axis of the prism may be marked.

This test is more satisfactory if the test line is vertical, and

the observer should have no insufficiency of the recti muscles. It works well with strong prisms, but for weaker prisms other tests are better.

II. If a line is observed with one eye closed while a prism is held a few inches in front of the other, a displaced image of part of the line will be seen through the prism, while a true image of part of the line will be seen outside of the prism. When the prism is rotated, the two images of the line become continuous. At this point the line corresponds to the axis of the prism. A card may be placed partly over the prism as before, so that its edge coincides with the unbroken line, and the axis may be marked from the edge.

This test is very accurate and can be used on the weakest prism.

III. If a person having one eye closed looks through a prism with the other, he sees a *strong* image displaced in a direction toward the summit of the prism. This image is formed by rays coming directly through the prism. If the object observed is luminous, a secondary *faint* image will be seen displaced more than the strong primary one, but displaced in the same direction. This image is formed by rays which are twice reflected within the prism before emerging from it. These rays pass through the prism, and striking the surface next the eye they are reflected back to the other surface. This in its turn reflects the rays, and they passing a third time through the prism, emerge from it. The direction of the rays is changed by this double internal reflection, so that when they emerge they are turned further toward the base of the prism than those which pass directly through, and the projected image appears nearer the summit. A line between similar points in the two images here also corresponds to the axis of the prism.

This faint secondary image is often, by the way, a source of confusion to both patient and oculist in tests with prisms. It can be cut off by covering the prism with a card having a small hole in it, through which the direct rays alone can pass.

IV. If a prism is held so that rays of light pass through it

and fall on a screen, the rays are deflected and instead of falling on the screen directly behind the prism, they fall to one side.

Behind the prism where no rays fall, the screen shows a dark patch in the position in which the shadow would be, if the prism were opaque. At one side where the deflected rays fall, there are double the number of rays and a patch appears here lighter than the rest of the screen. When the prism is held near the screen the light and dark patches are overlapped, and appear small and near each other.

But when the prism is removed some distance, if the rays are coming parallel the two patches will each be the size of the prism and a distance apart, and this distance increases as the prism is removed from the screen. The deflection is toward the base of the prism and in the line of its axis. A line then connecting similar points in the patches is the line of axis of the prism, *e. g.*, if the prism is rotated until the two patches become tangent to a horizontal line on the screen, then the axis of the prism is horizontal.

V. When a prism is held before the eye, a double reflection of objects behind the observer may be seen. Each surface of the prism reflects rays which form an image. From the surface near the eye the rays are reflected back directly. The rays reflected from the further surface pass through the prism twice and their direction is changed. Thus two images are formed which appear some distance apart. The distance between them increases as the object or prism is removed from the eye, and increases with the strength of the prism. Corresponding points in the two images are in the line of axis of the prism.

This is one of the simplest and most accurate methods of finding the axis of a prism. To perform it easily, a person may stand with his back to a window, after selecting a cross-bar of the window-frame that is of the height of the eye. Then the prism may be held before the eye on a level with it, and in a plane parallel to the plane of the window, and two images of the horizontal bar are seen. As the prism is ro-

tated the two images fuse at the ends and form a single line. If the prism is not held properly the line will be bent. But when the prism is held at the height of the eye and window-bar, and held with one surface in a plane parallel to the window, the two images fusing form a single straight line, and the line corresponds to the axis of the prism which may be marked from the edge of a card as in the other tests.

VI. When two prisms of equal strength are placed together with bases in opposite directions, the external surfaces of the combination are parallel, and the combination has simply the effect of a plain glass.

To find the axis of a prism whose degree is known, a prism of the same degree (or a combination equal to it) having a correctly marked axis, may be placed with base in the opposite direction against it, and this combination held before the eye. A line is then observed while the prisms are rotated. If the image of the line seen through the prisms does not move, and is always continuous with the image of the line seen outside the prisms, the axes of the two correspond. If there is some movement of the image when the prisms are rotated, or if the line does not appear always continuous, one prism may be turned on the other and the test repeated until the line appears always continuous, and is not altered by the rotation. Then the axes of the two correspond and from the correctly marked prism the other may be marked.

Some of these tests may often be found useful. And if oculists were to check the axis marks, they would be surprised to see how few prisms except those made by the most reliable houses, really have them correct.

SEVERE INJURIES TO THE EYE-BALL.

BY ADOLF ALT, M. D.

In these days of antiseptic surgery we are, perhaps, a little too apt to attribute every good (and perhaps unexpectedly good) result to the antiseptic measures which were employed. This enthusiasm, undoubtedly warranted in many instances, may perchance be apt to let us forget, that our good results cannot all be due to the novel methods and the theories they are based on.

It is, therefore, I think, sometimes well for comparison's sake to look back to our experiences before we adopted antiseptic measures, and to compare them with the more recent ones. I must say, that when doing so with regard to severe injuries of the eyeball, I was astonished, how good the results had been in fresh cases in my private practice before I applied antiseptic measures. Of course, I know full well, that the supposition that the injuring bodies were aseptic, may be adduced as an explanation. Yet, this does not absolutely satisfy my mind.

In the following pages I want to relate a number of cases of severe injuries to the eyeball, which I have seen in private practice during a period of five years, and which without antiseptics have healed well. I want further to state, that the number of fresh severe injuries which led to destruction of the injured eye, seen during the same period and in private practice is only two, and they were lost when I saw them first. The multitude of less severe injuries, burns, etc., is of no interest.

CASE I. J. H., æt. 17, a wagon-maker, had an iron rod run into his right eye, while stooping over the hole in the wagon through which the rod was being forced. Some water and blood ran out of the eye at once and sight was gone. I saw him three hours afterward and found the following: There was slight episcleral injection. Where the upper and middle

thirds of the cornea joined, a ragged wound with whitish edges ran somewhat curved across the cornea. Shreds of iris-tissue were hanging out of the two ends of the wound which both lay at the beginning of the ciliary region. One shred, like a thread, reached down upon the cheek. There was some blood in what remained of the anterior chamber. Sight was reduced to perception of light. I removed the prolapsed pieces of iris, and cleansed the wound as well as the unmanageable patient would allow. During this manipulation the as yet perfectly transparent, but evidently dislocated lens would present in the wound on the slightest pressure. There was evidently blood in the vitreous body, as no reflex could be obtained from the fundus of the eye.

The treatment consisted of rest on the back and the continued application of iced compresses. Under this treatment the wound closed and the blood became absorbed, so that on the eighth day after the injury he could count fingers at three feet. On the eighteenth day I discharged him with a deep anterior chamber in the lower portion, an anterior synechia, or rather multiple ones of shreds of the ciliary portion of the iris upwards, beginning cataract and $V=10_{/cc}$. Patient never allowed me any further operative interference. I have seen him the last time fully five years after the injury had been received, and found the lens almost totally absorbed, thus showing that its capsule had been injured. Some stripes of grayish capsule ran across the irregular and large pupil. There were the remains of a large rupture of the choroid running concentrically with and almost all around the optic papilla. V was then $20_{/cc}$, but could not be improved with glasses. He never felt any inconvenience from this eye.

CASE II. K. K., æt. 33, was struck into the left eye with a piece of wood by his infuriated wife whom he had ill-treated. Some blood had come out of the eye, and sight was greatly reduced. The next day, when I saw him, I found his sight $=6_{/ft}$. There was a ragged wound in the lower inner quadrant of the cornea extending to the corneo-scleral margin in which the iris was caught. The iris-tissue was discolored. The pupil

was very wide, especially upward, and the whole of the pupillary margin of the iris was tilted backwards. The lens showed dim stripes, as we see them in beginning senile cataract, the vitreous was dim and contained some blood. The lens was slightly dislocated up- and backwards. The upper and lower lids showed superficial wounds. Recumbent position and ice were ordered, and under this treatment the wound healed, and the inflammatory symptoms disappeared, as well as the blood from the vitreous body. When I discharged him twelve days after the injury had been received, the pupil and the pupillary edge of the iris were in the same condition, the vitreous body was liquid and contained some floating opacities. Sight was $\frac{8}{ec}$.

CASE III. F. B., a bottle-piler in a champagne factory, æt. 57, was struck into the left eye by pieces of a bursting bottle. I saw him on the same day. The upper lid was cut into by an oblique wound, and there was a corresponding cut in the lower one, which, however, did not reach the lid-margin. The cornea had a cut running across it obliquely in the lower outer quadrant, with its ends at the beginning of the ciliary region. The prolapsed iris lay in this wound and with it a bead of vitreous body. The lens was gone, and blood and fibrine filled the distorted pupil. Perception of light. The treatment was recumbent position and compressive bandage after abscision of the prolapsed iris. Later on, when some slight inflammatory reaction took place, iced compresses. The eye healed gently, and vision, although dim on account of large floating opacities, rose to $\frac{18}{ec}$. The wounds in the upper and the lower lid I stitched at the first visit. The lower lid by the traction of the scar became everted, and the ectropium was later on operated upon. The eye which I had occasion to see from time to time for several years did not cause any inconvenience.

CASE IV. H. P., æt. 12 years, had loaded a bottle with powder and applied a fuse to it. When he thought this had gone out, he blew on it and the bottle promptly exploded and cut his left eye. I saw him three hours afterward. There was a T-shaped cut in the sclerotic on the nasal side of the eyeball,

the horizontal branch of the T lying vertically and passing through the ciliary body. The triangular gap was filled by clear vitreous body. No pain was complained of. $V=^{20}/_{cc}$. The reflex from the fundus was good, but no details could be made out. Under a compressive bandage in the recumbent position this wound healed rapidly and firmly, so that three weeks after the injury a flat and contracted scar was all that remained. The scar in the choroid and retina was also well visible with the ophthalmoscope. $V=^{20}/_{xxx}$; Sn. No. 2 easily. Although six years have passed since, this eye is to-day as good as it was when I discharged the patient.

CASE V. B. F., æt. 40, boss in a quarry, was severely injured all over his body and on his eyes by a premature explosion. I saw him two days after the injury was received. I found the lids of both eyes œdematous and much swollen. The left eye was chemotic, there was a torn, ragged gap in the lower third of the cornea through which iris, lens substance and some vitreous body protruded. There was purulent panophthalmitis, $V=0$. This eye became soon phthisical.

The right eye was also somewhat chemotic; sclerotic and cornea were studded with grains of powder. There were two openings in the cornea in its lower half, the wound lips being evidently burned. There was no anterior chamber. Whether the lens was injured could not be distinctly made out. Where the cornea was perforated large ulcers developed which only after long and careful nursing healed with anterior synechiæ. During this time the lens into which several grains of powder had evidently penetrated, began to become cataractous. It took a whole year for this eye (the lids were, besides, suffering from trachoma) to become quiet, new attacks of inflammation coming on again and again. To have the cataract extracted the patient absolutely refused. Yet, I succeeded in making an opening into the zonule of Zinn behind a clear portion of the cornea, through which by the aid of a convex lens he can count fingers at twelve feet, and with this amount of vision he has now for four years been able to superintend his work again, without further trouble.

CASE VI. E. J., æt. 26, had been trying to bend a piece of iron a few hours before I saw him. The iron broke off and struck the right eye, which he thought had become blind at once. There was a straight, sharp cut in the cornea forming a tangent to the margin of a middle wide pupil. The anterior chamber was very shallow, the pupil contracted and the portion of the lens corresponding to the wound in the cornea was gray and untransparent. When the pupil under the influence of atropine began to dilate, the pupillary margin of the iris was adherent to the dim portion of the lens and appeared pressed into it. This posterior synechia remained permanent. The dimness of the lens gradually disappeared until it just formed a thin grayish ring around the place, where the iris was attached to and apparently blocked the rupture in the anterior lens-capsule. This condition has now for two years remained unchanged.

CASE VII. C. C., æt. 6, had been injured in the right eye by a gun-cap several days before I saw him. I found the eye but moderately congested. There was a small healing wound in the lower part of the cornea near the corneo-scleral margin and parallel with it. The pupil was contracted. There lay a small shining body between the pupillary edge of the iris and the dim lens. When I succeeded in dilating the pupil somewhat, this shining body grew in size as the pupil dilated. I then reopened the old wound, but soon found that it was too small for the removal of the foreign substance and enlarged it. Then entering with a smooth forceps I tried to move the piece of gun-cap, but could at first apparently not move it. Gradually I got it loose, but in order to get it out of the eye, I had to move it first upward sliding upon the anterior surface of the upper portion of the iris. After having done so, I could withdraw it from the wound. It was a flat piece of percussion cap, nine by four millimetres in size. No reaction followed, excepting that due to the gradual swelling of the injured lens. After having, however, extracted most of that on the fourth day after the removal of the foreign body, all inflammatory symptoms subsided, and the patient went away with a healthy and useful eye.

CASE VIII. L. B. S., æt. 55, carpenter, was struck into the left eye a few hours before consulting me by a piece of a nail which broke off while he hammered it into a board. I found a piece of conjunctiva torn off and a ragged wound in the inner half of the cornea near the corneo-scleral junction. The iris protruded through this opening, there was some fresh blood in what there was of an anterior chamber, and evidently blood in the vitreous body, as no reflex could be obtained from the fundus. It could not be made out distinctly whether the lens was injured, but it was very probable from the condition of the injury. V. reduced to perception of light. The prolapse being snipped off, I ordered recumbent position and iced compresses. In the next few days a slight iritis was developed, but it yielded soon to the instillations of atropia. Gradually the blood became absorbed and V. rose to $\frac{8}{200}$ in the second week after the injury had been received. There were now a number of large floating opacities in the vitreous body. When I saw him a year later, the lens was very dim, but he did not think of eventually allowing its extraction.

CASE IX. Ch. D., æt. 38, wire-puller in a large wire factory, was struck into the right eye half an hour before consulting me by the broken end of the wire he was pulling when it snapped in two. Sight was at once abolished. I found a triangular wound in the outer lower quadrant of the cornea near the corneo-scleral margin, to which corresponded a similar triangular opening in the iris. The bottom of the shallow anterior chamber contained fresh blood. No reflex could be obtained from the fundus. Under iced compresses applied continually while the patient was in the recumbent position the corneal wound healed and the blood in the anterior chamber disappeared. A week after the injury had been received the pupil was dilated *ad maximum* and large floating opacities were seen in the vitreous body. V. was now $\frac{20}{\infty}$. The transparent lens was tremulous and pressed the site of the traumatic opening in the periphery of the iris forward into the anterior chamber. No inflammatory symptoms ever made their appearance.

CASE X. F. W., æt. 14, employed in a soda-water factory, was engaged in corking bottles, when one burst and a piece struck his left eye. I saw him the day after: he was in great pain, and the lids of the left eye were considerably swollen. There was a cut in the cornea corresponding to the inner margin of a middle wide pupil. The anterior chamber was empty and corresponding to the corneal wound the discolored iris was literally pressed into the anterior lens capsule. The lens, when the unadherent portions of the iris had yielded to the influence of atropine, showed the symptoms of an anterior cortical cataract, so dim already that no details of the fundus could be made out. Under iced compresses in the recumbent position the wound healed nicely, so that two weeks after the injury had been received the eye was almost free from any signs of irritation. During these two weeks the dimness of the lens gradually disappeared and the fundus of the eye became more and more clearly visible. When I discharged the patient the dimness of the lens was confined to the site of the posterior synechia and V. was $\frac{20}{200}$. I have seen the patient about a year afterwards and found the condition exactly the same V. had increased to $\frac{20}{1}$.

This case is almost identical with case VI. at least as far as the posterior synechia and the lens are concerned. In both cases the anterior lens-capsule has evidently been injured and the iris been forced into this wound. Whether the resulting partial cataract was due to the mechanical disturbance of the lens-fibres and to the fact that they had been shifted out of position in an irregular manner, or to the imbibition with aqueous humor, is not clear. Certainly these conditions became changed and the norm was almost re-established as soon as a firmer adhesion, due to proliferation, had taken place between the iris and the wound in the lens-capsule. If the imbibition with aqueous humor was the cause of the cataract, this solid synechia may have acted like a stopper, so to speak, and may have prevented any further amount of aqueous humor from entering the lens-substance.

I have since refrained from absolutely predicting the formation of a cataract after similar injuries.

CASE XI.—J. M., æt. 32, when opening a soda-water bottle was struck on the left eye by the cork. Sight was at once considerably impaired and had remained so when I saw him several days afterwards. The pupil was dilated by atropia. The central portion of the anterior corticalis of the lens to the extent of a medium wide pupil was gray. Through the periphery of the lens the fundus could be seen. There was venous hyperæmia of the retina, the optic papilla was brick-red. Three weeks afterwards the lens and fundus were again normal and sight ²⁰/_{xxx}.

This case is related here in connection with the others on account of the disappearance of a considerable amount of dimness of the lens caused by an injury.

CASE XII.—H. B., engineer, æt. 29, when working on putting up an engine, was struck in the left eye by a foreign body. When I saw him a few hours afterwards, I found a wound at the inner corneo-scleral margin from which a piece of metal protruded. I extracted it at once, and found to my astonishment that it was $7\frac{1}{2}$ millimetres long. There was also a prolapse of the iris, which I snipped off, so that it amounted to a regular iridectomy. It was now seen that the metal had pierced the equator of the lens. The wounds under ice healed kindly and quickly. The cataract progressed rapidly: the patient who did not want to lose any further time refused extraction. I thereupon needled it and the result was very satisfactory. Patient has not experienced any further inconvenience from this eye.

CASE XIII.—D. J., æt. 33, carpenter, was struck by a beam into the left eye. He came three days later to consult me. There was a perpendicular healing wound in the upper lid extending upwards into the brow. The lid was considerably swollen. The eye was greatly injected, there were deposits of lead on the cornea and conjunctiva (some lead-wash having been prescribed by some physician); almost the whole of the upper half of the discolored iris was torn from its ciliary insertion, tilted forward, and its periphery was held in a small opening of the cornea a little below its centre. The lens was dim

and the vitreous body filled with blood. I removed the deposits of lead, made an iridectomy upwards, and in doing so cleansed the corneal wound of the iris tissue. I then applied a compressive bandage. Within the next few days there was great pain and irritation, yet the wounds healed gently. The cataract which was formed I operated later on by discission, V. ²⁰/₂₀₀.

CASE XIV.—K. M., æt. 14, was shot into the right eye by some pin-like missile sent from a bean-shooter. I saw him the next day and found V.=¹. There was some circumcorneal injection. In the centre of the cornea was a small opening through which a thread of fibrine protruded, which on its other end was connected with some fibrinous exudation in the very narrow pupil. When I had succeeded in dilating the pupil there remained two or three fine posterior synechiæ. The lens which had evidently been pierced in an oblique direction was generally dim and swollen. Two days later when the rapid swelling of the lens matter caused severe pain and glaucomatous symptoms, I extracted about half of it. Under ice and while the patient lay quietly on his back the wounds healed well. A few weeks later I made discission of the remaining portion of the lens, which caused no disturbance and brought vision up to ²⁰/_{xx}.

CASE XV.—Miss E. B., æt. 27, while breaking a bottle was struck by a piece into the right eye. Patient had very protruding eyes, having a myopia of ¹/₃. I saw her four hours after the accident. The lids were then considerably swollen. There was a clean cut running obliquely from down-inward to up- and outwards through cornea, iris and lens, sclerotic and ciliary body. Shreds of iris lay in the wound. There was no anterior chamber. V=0. Enucleation being refused, I trimmed the wound, and had ice applied in the recumbent position. The wound healed nicely. For a time the cataractous lens was much swollen, and the scar seemed to become ectatic. But this subsided again and gradually a small pupillary opening appeared up- and outwards behind which the lens-substance was sufficiently absorbed to allow of counting fingers at eight feet. No further disturbance has occurred in the year which has since elapsed.

TRANSLATION.

The following biography of Prof. Ferdinand von Arlt, of Vienna, whose death we announced in our last issue is from the hand of his able pupil, Professor Sattler, now of Prague, who in the name of the Heidelberg Ophthalmological Society, laid a wreath on the last resting place of the deceased and pronounced the following eulogy:

FERDINAND VON ARLT

1812 TO 1887.

The Ophthalmological Society sends through me to their oldest and truest member, to their honored nestor, the last and parting greeting.

Since it was founded, twenty-five years ago, thou hast every year, with scarce an exception, wended thy way towards the beautiful city on the Neckar, where thy greatest and most ingenious pupil, the incomparable A. von Graefe, gathered his colleagues and friends around him for the mutual exchange of experiences and for free and friendly intercourse. Here we could witness the true, unfeigned, lasting friendship by which these two eminent men of so different a character were united. And, when the most brilliant star of the three on the ophthalmological sky became extinguished, it was on thee and Donders that year by year all signs of veneration and love were heaped, which esteem and friendship can offer to mortals. Never couldst thou answer the toast without tears of emotion, which one of us in token of the universal esteem brought to thee in the name of the society. The amiable, modest manner in which thou didst meet with us there, teaching, and, as thou saidst thyself, learning, the way in which thou didst encourage and help the young scholars with benevolence and forbearance, and in which thou didst strive to correct what appeared to thee erroneous, could not but win thee the hearts of all of us. No

wonder that the number of thy friends and admirers grew steadily, since thou didst gain new ones continually and never lost one, holding them all fast with the charm of thy amiability. There in Heidelberg, amidst thy young and old friends, thou wast ever at home, there thou wast rejuvenated, thou couldst forget all sorrows, which were not spared thee during thy earthly career. Here, at thy resting place, we mourn not the loss of a warm-hearted promotor of our society, of the model of a conscientious, reliable worker only, but we deplore also the loss of the best and truest of friends. Thy memory will live gloriously in our society as long as it exists. Peace to thine ashes!

March 7. at 2 o'clock, P. M., the earthly career of a man of the highest eminence in our special science has been closed. Ferdinand von Arlt, whose name is connected with fully eight lustra of the history of ophthalmology, is no longer among us.

Clear and well rounded, as the life of few only, his life lies before us; because his manner was open and unaffected, and he has preserved a natural, often pathetic naiveté, to his end. There was nothing enigmatical, nothing repulsive in his manner; truth and reliability formed the main traits of his character. With his friends he knew no secrets.

The brilliant stride forward made by ophthalmology in the second half of our century took place during the time of Arlt's teaching and active life, and this fact gives to the life of this man an especial interest for us ophthalmologists.

Born April 18, 1812, at Obergraupen, near Teplitz, in Bohemia, he was the fourth of the six children of a poor smith in the mountains, and grew up in poverty. He learned early how to bear wants, how to deprive himself of luxuries, and how to be satisfied with only the most necessary. When eight years old, he was given into board with a relative, the school-master at Weiss-Kirchlitz, and himself was to be educated as a school-teacher. Here too, he did not see his best days, and, since he did not have the talent for music, then thought necessary for a school-teacher, he was sent together with his brother

Dominik to the gymnasium at Leitmeritz when he was thirteen years old, there to prepare himself for the ministry. Here, too, on account of the insufficiency of the subsidies sent by the parents, the two brothers had to go through bad times. Dependent to a large portion on the help of benevolent people, to whom he showed himself grateful all his life, the youth was early trained and armed for the earnest fight of life, and forced into the hard path of diligent, untiring labor, which later on bore such a richness of fruit.

Beginning with the third year at the gymnasium he earned his subsistence by teaching younger pupils. When entering the University of Prague in the fall of 1831 with his brother the sorrows regarding their life were renewed. Having succeeded in getting a position as teacher in a family, he changed from the studies of theology to those of medicine (to the great sorrow of his mother), and embraced the latter with diligence and enthusiasm. * * * Among his teachers, who with a few exceptions cannot be called eminent, he was chiefly attracted by the professor of ophthalmology, J. N. Fischer. This circumstance decided his choice of ophthalmology for his practice.

Fischer came directly from the celebrated school of Beer, but, though remaining upon the standpoint of that school, he was greatly taken with the new and strongly scientific current of thought in studying and teaching medicine just then inaugurated by Skoda and Rokitansky. He promised Arlt, who was his pet pupil, a position as assistant in his clinic, when he had graduated in the fall of 1839, but imposed it upon him to first go to Vienna for three months. He there listened to Skoda and Rokitansky's lectures and demonstrations, and took a course on surgery with the then renowned Friedrich Jaeger.

In April, 1840, Arlt took the place as assistant to Professor Fischer, and remained in it for two years. They seem to have been on extremely intimate and friendly terms together, and so remained further on.

During the time between 1842 and 1846 he practiced also internal medicine and surgery besides ophthalmology; his sci-

entific and literary work, however, was especially and continually given to his special profession, and what is especially interesting, he delivered as an extraordinary docent, the first lectures on otology. Troeltsch received his first lessons in this branch by Arlt.

In 1847, when Fischer (then seventy years old) began to be sick, Arlt, at his request, was nominated to fill the chair of ophthalmology temporarily, and after Fischer's death in 1848, Arlt was one of the candidates who took part in the concours for that chair, as was then the custom. The decision was not rendered until late in the summer of 1849 on account of the political excitement, and an equally strong rival, Jos. von Hasner, who had also taken part in the concours, had very good chances. But, finally, after Arlt had been called to the University of Leipzig as professor ordinarius, he was given the professorship in Prague.

Having thus reached his aim he displayed an extreme love for study and a fruitful literary activity, aside from his untiring devotion to his position as teacher and large and blissful practice as oculist and operator. With regard to his literary activity the period at Prague, 1842 to 1856, is undoubtedly the most important one, when judging the position of this man in the history of ophthalmology. Here his ideas became clearer and clearer, and free from the old and traditional: here he deposited them when perfectly matured in a number of valuable papers, which, in the *Prague Monthly for Practical Medicine*, at that time an esteemed and widely circulated journal, were given to the scientific world. Here also he wrote his really classical text-book on the diseases of the eye, which appeared in three volumes in 1851, 1853 and 1856. In order to put the right value upon the enormous progress which is made in Arlt's text-book, it is only necessary to remind the reader of the text-books which were especially in use in the beginning of the fifth decade, although even they contained a great deal that was good. Strictly logical in the arrangement of the matter, he knew how to unite in one clinical picture what belonged together, and he distinctly separated those heterogenous con-

ditions which until then had been frequently confounded in the most unnatural manner. All through we find an admirably strict observation of nature and understanding of the phenomena; we think the description of the different diseases unexcelled; the many real models of histories of cases which are given at the proper places are especially instructive. He knew, as hardly any one else, how to keep the right measure in making use of the anatomy for the explanation of symptoms, and to give the general condition of the organism its due. Although the anatomical order was the guiding principle in the arrangement of the book, and although he laid great stress upon the study of the normal and pathological anatomy of the eye, in order to understand the physiological and pathological phenomena, and although he did a great deal of highly useful literary work in this department, he never lost sight of the importance of the search after the etiological moments.

In some of the ophthalmological text-books which appeared at the same time or even somewhat before, and in the numerous ones which have been published later on, the anatomical tendency, to which we undoubtedly owe infinitely much in medicine, has, under the influence of Rokitsansky and Virchow, come more and more exclusively into the foreground, according to the prevalent opinions of the period. For the sake of the anatomical arrangement and the anatomical nomenclature, and hand in hand with the increasing knowledge of the anatomical changes, and the sharper definition of the local processes, the study, after a possible connection with some affection of the general system, was more and more lost sight of. * * *

* * * Arlt never forgot that, with all due recognition of the importance of an exact analysis of the local changes and the necessity of local therapeutic measures, the condition of the remaining organs and maybe general affections, would require just as much and perhaps the main attention. And this tradition has lived ever since in Arlt's school, and has been destined to come more and more to the front.

This superiority secured for Arlt's text-book, among the students and as a help to the general practitioner, a degree of

popularity as none of the contemporaneous books and but few of the later ones have enjoyed. Since the largest portion of his book was written at the time before the ophthalmoscope had been invented, it is natural that the part which treats upon the diseases of the conjunctiva and the anterior portions of the eyeball, is the most valuable one. This anterior portion of the eyeball has always more especially been the domain of Arlt's teaching and working. What he has taught and written with regard to it—notwithstanding that we may not agree with it in all particulars—as a whole decidedly the best that our literature possesses on this subject.

Arlt, however has also earned a lasting fame by bringing some light into the then dark region of the deeper diseases of the eye by ingenious observation and careful anatomical researches, by the exact dissection of myopic eyes and the recognition of the connection between the elongation of the eyeball and myopia.

In making anatomical specimens he excelled by his technique, cleanliness and exactitude. This is proven by his numerous sections through the whole eyeball, his most instructive preparations concerning the anatomy of the orbicular muscle, and the lachrymal sac, and, not least, by the communications regarding the anatomy of the eye in the third volume of the *Archiv fuer Ophthalmologie*, 1857. I may state here that Arlt discovered the existence of circular fibres in the ciliary muscle, and recognized correctly their action during the accommodation of the eye sooner than did Heinrich Mueller.

We must not here forget the popular book, "On the Care of the Healthy and the Sick Eyes, with an Appendix on Spectacles," which appeared during the period at Prague, and had several editions. This book had an enormous circulation and popularity, and stood far above the different similar books with which then and later the public was flooded, on account of its clear and pregnant description, the rich treasures of experience, and the scientific character visible throughout. More than in any other of his works we here recognize the inmost character of our honored master as a humanitarian, as physician and as teacher.

It was also at Prague in the fall of 1848, that the young Graefe visited Arlt, and was so powerfully attracted by the manner in which he practiced and taught ophthalmology that this mainly confirmed his intention to give his life to the practice of this branch of medicine.

From that time an intimate and mutual friendship united these two heroes of our science until death.

After having enlarged his knowledge and experience considerably in Paris and Vienna, Graefe returned in July, 1850, for a fortnight to Arlt, in order to discuss with his friend so many yet open questions in ophthalmology, and other things weighing on his mind.

In 1855 Arlt was made one of the editors of the *Archiv f. Ophthalmologie*, and although he did not contribute many papers to it, the few published there are of high value, especially those of an anatomical and clinical character, which show his eminent qualities in the best light.

When, by the death of Rosas in 1856, the chair of ophthalmology in Vienna became vacant, Arlt was called to it and taught there until the latter part of July, 1883. In this year—he had reached his seventieth year already in 1882—he left the chair, according to the law existing in Austria.

Above we have called the period of time Arlt spent at Prague the most important in judging his position in ophthalmology, and he himself thought always of that period with especial feeling, yet his period at Vienna, after he had conquered the difficulties which presented themselves there to the newcomer, very soon became the most brilliant period of his life.

His successes as physician and as operator, combined with his amiable, truly humanitarian manner in which he treated whoever came to ask his help, soon brought an enormous number of patients into his clinic, and procured him an almost overwhelming private practice. He met rich and poor with the same careful attention. He saw in every patient first the sufferer who needed sympathy, in the second line only the object for study and teaching. And even where his art was helpless, he knew, in his own peculiar way, to give solace to the unfor-

fortunate, and thus to benefit him. How often, when the means were wanting to carry out the necessary dietetic and hygienic measures, did he unnoticed slip the necessary sum into the hand of a poor child's mother. How many are the indigent ones, who, since they were ashamed of going to the public clinic, were treated by him gratuitously or almost so at his private office!

His mastership in operating was admirable, and he did not lose it even when his old age rendered his hand sometimes a little shaky. It may be that his coevals, von Jaeger and von Hasner, operated with superior elegance, yet the quiet security of every step, the care with which he attended to everything, even to the bandaging of the patient, cannot be too much extolled. He, like them, was ambidexter, and he never tired of insisting on the supremacy of this faculty, which is an heirloom of his school.

When we ask why Arlt, who was a master like but few in the flap-extraction, gave up this method in 1866, after von Graefe in 1865 had recommended the linear extraction, and which he like others had first to exercise, we can only say that this was to be expected from his modest ways and from the principle to let every personal comfort give way to the weal of the patient. This was the more natural since, from the convincing manner in which von Graefe knew how to inaugurate his new method, there seemed to be a justified hope to diminish the percentage of losses still more which, in Arlt's hands with the flap extraction at Prague as well as at Vienna, had been seven, and some tenths per cent. That this was the correct proposition is shown to evidence in the statistics of his operations as published in the hand-book of Graefe and Saemisch, Voi. III, 1.

Arlt evinced a rare love and devotion in his profession as teacher throughout his life. He was, so to say, in his element when in the clinic and surrounded by a dense crowd of pupils; here he became rejuvenated in every semester. It was not the power of a brilliant rhetoric, not the endowment with ingenious *apercus*, not his sonorous voice, that captivated the audience, but just the simple perspicuity of his words, the precision

of expression, the logical building up in the description of the pathological processes. He spoke just as he wrote. He was, however, not satisfied with the lecture, but gave the preponderance to the demonstration. He took great care that every one should see and really understand the case on hand. He evinced a great pleasure when, at the close of the lecture hour or during the holidays, during which he used to come to the clinic with but rare exceptions, he could discuss finer details of ophthalmological questions which could not be brought into the lecture, with a circle of especially diligent students or foreign physicians. It was especially his private courses in operating, which he held every year until 1871, and to which he invited some of his pet students, which proved so attractive to foreigners who, in large numbers, crowded his clinics from all parts of the civilized world. These courses were indeed unequalled on account of the clear and precise descriptions of the indications, the detailing of all the possible mishaps during an operation and the rules how to prevent them, and also on account of the pains he took to teach each and every one the technics. What he taught up to 1871 is deposited in his classical work on operations on the eye in the hand-book of Graefe and Saemisch.

Every semester he used to give a number of systematic lectures on the errors of refraction and accommodation.

He did not demand a knowledge of the use of the ophthalmoscope from his students, partly because on account of the enormous number of students it was impossible to give them a thorough instruction, which alone might be of lasting value to them, and partly since his chief aim was to push the students so far that they learned how to observe correctly, that they felt secure in the diagnosis of the typical forms of diseases, that they could give the right prognosis and knew how to order rational therapeutic measures. He let his assistants give regular courses in ophthalmoscopy, and occasionally they held courses in ophthalmic surgery, in errors of refraction and accommodation, sometimes also on ophthalmometry, and normal and pathological histology of the eye.

Arlt always was on extremely friendly, even intimate terms with his pupils and assistants. They felt attached to him by grateful love and many of them remained in close friendship with him as long as he lived. He assisted them in their scientific work, and did all he could to make their future a bright one.

It was also given to him, as to few masters, to see a comparatively large number of his pupils engaged as professors and working to enlarge and spread his teachings. They are: Businelli at Rome, Rydel at Krakau, Becker at Heidelberg, Schulleck at Buda-Pest, Fuchs, first in Luettich, now in Vienna, and the writer of these lines, first at Giessen, then at Erlangen and now at Prague. Others are renowned practicing ophthalmologists, as Koller, von Reuss, Arlt, Jr. and Bergmeister at Vienna, Kerschbaumer at Salzburg, Denk at Linz. His last two pupils were Dimmer and Herz. Of two of his pet pupils, Tetzner and Bierman, death had robbed him.

Besides the papers in the *Archiv f. Ophthalmologie* the revised edition of his text-book on diseases of the eye and his treatise on ophthalmic surgery, there are a number of other publications which fall in his Vienna period. The injuries of the eye (*Wiener Med. Wochenschrift* and separately 1875); on the etiology and therapy of the blenorrhœa of the conjunctiva (*Mittheilungen des Vereins der Aerzte in Niederösterreich*, 1875); on the causes and the development of myopia, Vienna, 1876; on glaucoma, Vienna, 1884. The last two, the second of which is from the time after his retiring from the chair of ophthalmology, are of considerable importance; they open up a multitude of new points of view, and evince, apart from an untiring diligence, the unweakened ingenuity of the master. The quantity of valuable experiences which are especially collected in the last work make it an extremely valuable heirloom.

It is well known to all those who had the yearly occasion to greet the juvenile old man at the meeting of the Ophthalmological Society how lively was his interest in the progress of our science and her representatives until his last disease broke out. In the same way he enjoyed without limit the esteem

and veneration of all of his friends of many years, as well as of the younger members who there only made the acquaintance of the celebrated master, with his modest, retiring exterior.

Nor did he lack honors and signs of recognition from the government. He received the order of the Iron Crown, which raised him to the nobility, and numerous other orders, and in 1877 the title of *Hofrath*. For his 70th birth-day his friends and admirers came from far and near to bring to the beloved master a warm and heartfelt birthday greeting. It was a truly exalting feast, as it is in store for but few mortals, and it showed clearly the intimate relations between him and his pupils and friends.

Arlt, with all his eminence, possessed an uncommon degree of modesty, simplicity and lack of wants, as it becomes now rarer every day, and in a similar measure his infinite goodness of heart was a main feature of his character. For the indigent he had always an open hand, and to the poor student he was the more a fatherly friend, since he never forgot the hardships of his own youth, when the benevolence of noble patrons helped him on.

He never in his life forgot the attachment to his birth-place. He visited there every year during the holidays, built a school-house there, for which he had drawn the details himself, and many patients whom he operated upon there and in the vicinity, owe to him the sight they have regained.

It is deeply to be deplored that the rich life of so noble and eminent a man was to end in such a sad manner.

The trouble began from an unfortunate jump from a carriage, where he fell and broke the right arm. Although this fracture healed unexpectedly well a deep depression of his whole system and at times absolute insomnia supervened. In order to gain restoration and new strength he went in the beginning of last August to Johannesburg, in Bohemia. There he was suddenly attacked by gangrene of the left leg. After having nearly died at several occasions and having suffered continually from dreadful pain and insomnia, and in spite of

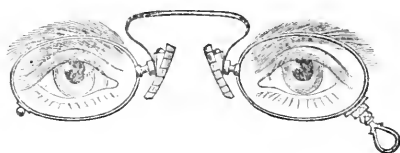
repeated operations he succumbed to his disease but a few weeks before his 75th birthday, in the arms of his loving daughter.

Not only his remaining family, not only his friends and colleagues, but thousands of grateful patients and pupils mourn the noble departed.

EDITORIAL NOTICE.

We have just received a copy of Dr. Swann M. Burnett's book on Astigmatism, published by J. H. Chambers & Co., and we bespeak for it a hearty welcome from our colleagues.

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A CASE OF PEMPHIGUS OF THE CONJUNCTIVA
WITH REMARKS.¹

BY ROBERT TILLEY, M.D., CHICAGO, ILL.

The case which I present to you for inspection is happily not a common one.

You see before you a boy, C. T., of 12 years absolutely blind. He can simply distinguish night from day, and as he is certainly beyond operative relief he may with scientific accuracy be termed blind. He is blind, however, not from any disorder of the optic nerve, not from any central lesion, not from any affection of the uveal tract, nor from any primary affection of the lens or cornea, not from any traumatism, but from a complete closure of both upper and lower conjunctival cul-de-sacs and a complete adhesion of both lids to the eye-balls, the adhesion having taken place with the lids nearly wide open.

He was in practically the same condition in the early part of the year 1882, when I first saw him as he is now, only

¹Read before the Ophthalmological Section of the American Medical Association, Chicago, 1887.

at that time there was a large amount of photophobia and a certain amount of acute swelling in the border of the lids; also there was a good deal more evidence of the existence of corneal tissue than now. There was at that time practically no difference in the two eyes; the left had slightly the most unpromising appearance.

I say he was practically in the same condition, I mean, of course, relative to his eyes.

There were at that time numerous bullæ over the body and one in the buccal cavity on the left side of the cheek, and an angry vaccination pustule about an inch in diameter on the left arm. These bullæ continued to appear at intervals over the body for about four years. There has not been any appearance of them according to the statement of the mother for the past year; all traces of them have disappeared except two almost symmetrically located on the two sides of the chest, where supuration evidently occurred; these you can inspect for yourselves.

The history obtained from the parents is that all the children were vaccinated at the same time, but that the vaccine point which was about to be used for the patient was dropped, seized by a dog and still used. That after the vaccination fever occurred and from that time his eyes became inflamed so that in a brief period "they were as red as raw beef." The vaccination occurred in February, 1881, and the mother is confident that the boy has not been able to see since the month of April, 1881. Previous to the vaccination the mother is confident that there had been no affection of the boy's eyes whatever.

I mention this history particularly because of its relation to a quotation by McCall Anderson from Sir Erasmus Wilson which I shall make later.

It was to relieve this severe redness of the eyes and closure of the lids that the child was taken to an eminent oculist of this city about the month of April, 1881.

I am unable to describe the condition of the eyes at this time, but I learn that the attendance was limited to about three or four visits.

The interesting feature of this case is the evidence of healthy eyes prior to February, 1881; the appearance of redness and swelling and, according to the mother, inability to see since April, 1881, and my own personal observation of this hopelessly blind condition in the month of January, 1882, all certainly within a year and in all probability the whole difficulty occurred in two months. Further the presence of bullæ on the body developed after the destructive closure of the lids; their appearance in successive crops for a period of four years; the disappearance of all traces of these bullæ except two which ulcerated on the chest; and I think I may add the absence of any evidence of any inherited constitutional trouble. I will add here that none of the other children were affected in any similar way.

Are we then justified from these facts together with the present condition of the eyes, which you can inspect for yourselves, and which will be described more minutely later, in concluding that during the period of severe redness and inflammation the bullæ of pemphigus invaded so extensively the conjunctiva as to destroy its texture completely, and cause this complete adhesion of the lids to the eyeballs? In other words that this is a genuine case of that rare affection, pemphigus of the conjunctiva of an unusually severe type.

You will observe that the time of development of the disease to such a disastrous result was very short and that there is no evidence of any previous trachoma.

This I consider strong evidence of some destructive agency, and in the absence of any traumatism of any kind would be best explained by supposing the existence of blebs with possibly slight suppuration destroying the thin and delicate conjunctiva.

As you inspect him you will observe that the corneæ of both eyes, if any corneæ may be said to exist, are dry and horny; that they are never moistened by tears or mucus of any kind. You will see that the lashes are not much inverted; that the lids are completely adherent to the globes throughout their whole extent, and yet that the adhesion is so loose that it is evident that the pathological process has not invaded the deep

tissues of the lids. You will see that the puncta lachrymalia are obliterated or at any rate not visible; that the palpebral fissure is of nearly normal length; that the distance between the lids in the centre is not far from normal; but that from the borders of the lids there extends over the eyeball a dry horny pellicle, and that in the centre of the external surface of each eyeball is a small dry residue of a former tissue. I have seen no evidence of the secretion of tears.

I think you will fail to find any evidence from the contour of the face or teeth of inherited trouble; the teeth, however, are markedly irregular, but they cannot be referred to the classical teeth of Hutchinson. When I saw him in 1882 this peculiarity of the teeth had of course not appeared, he was then about six or seven years. As you look at the teeth it would appear that the upper two central incisors are separated by a tooth of another kind.

There is one thing that I must not fail to mention, that is that the mother has been and still is subject to a contracted condition of the conjunctiva of the upper lids resulting in inverted cilia. That is the only fact that seems to be of interest relative to the family history. There are in all six children with only one death.

Early in the year 1882 I tried assisted by Dr. Gradle and Dr. Niles, the family physician, to separate the lids from the ball of the left eye, but the result coincided with the experience of others—it was a failure. There were no operative measures taken with the other eye.

Assuming that we are justified in calling this the result of a case of pemphigus, then it must be quite a unique case. According to Pflüger, as quoted by W. Lang in the transactions of the Ophthal. Society of the United Kingdom, 1886, Hebra had seen up to the year 1873, two hundred cases of pemphigus but in no case did it affect the conjunctiva. Of course it may be said that patients so afflicted would be more likely to visit the ophthalmologist than the dermatologist, but the cases are also exceedingly rare in ophthalmological literature.

The subject has on two occasions been brought before the

Ophthalmological Society of the United Kingdom, and in its transactions for 1826; Mr. W. Lang reviews the literature of the subject, and says that up to that time only twenty-three cases had been published. The first was published by Mr. White Cooper in the L. O. H. Reports, July, 1858 and that only one of these was published in America.¹

In the *Traité Complet d'Ophthalmologie* by De Wecker and Landolt, p. 438, we read: Pemphigus, even when universal, only rarely affects the conjunctiva.

Prof. Von Arlt, of Vienna, in his diseases of the anterior part of the eyeball as translated by Dr. Lyman Ware, says: "Conjunctival pemphigus is an exceedingly rare disease. The author has seen but two cases, and they had run their course." If a veteran of Von Arlt's experience had only seen two cases there needs no other evidence of its rarity.

Mr. W. Lang in his report above referred to presents three cases two of which had already been presented to the society under the title of "A Peculiar Affection of the Conjunctiva," Mr. Lang strove to show that the cases published under the head of "Essential Shrinking of the Conjunctiva" by Von Graefe and the syndesmitis degenerativa of Stellwag properly belong to the same affection and should be classified as pemphigus of the conjunctiva. The subject, however, elicited much discussion and a difference of opinion.

In referring to the dermatologists we find in Besnier's translation of Kaposi, p. 57: In pemphigus bullæ have also been observed in the conjunctiva. Pemphigus when it attacks the mucous membrane is sometimes confined to that membrane or precedes the lesion on the skin. According to McCall Anderson it seems to be occasionally called into activity as the result of injuries, he says Sir Erasmus Wilson has recorded two cases of this kind. (McCall Anderson, 1887, p. 255).

A servant girl poisoned her hand with a red paste with which she was cleaning brass. A few days afterward a crop of

¹I have since learned that one case was reported to the Ophthal. Sec. of American Med. Asso. in 1886 by Dr. Dickinson, of St. Louis.

bullæ intermingled with ecchymosed spots came out over the wrists and forearm, and continued to trouble her for seven years.

The other case was one of a medical man who punctured his right hand ; three or four weeks afterwards an eruption of bullæ made its appearance on his right thigh and was repeated from time to time for eighteen months. The outbreak was preceded by feverish symptoms, there was a scalding sensation in the skin and the next morning a fully developed bulla would be discovered.

I will not attempt to refer this case to its appropriate section as pemphigus vulgaris or pemphigus foliaceus. I will leave that for dermatologists.

The special characteristics of bullæ on the conjunctiva, if there are any special characteristics must also be left for those who have the privilege to observe them. I can find practically no direct statement of a well observed case. All the writers on the subject coincide that such blebs on the mucous surfaces are very fugitive and from the delicate nature of the mucous membrane of the conjunctiva and the constant friction of the parts their character would be still more fugitive on the conjunctiva.

I certainly saw one on the inside of the left cheek, it was about three-quarters of an inch long and five-eighths wide. It was moderately distended, the edges terminated abruptly, there was no manifest inflammation around the edges, and it did not seem to give any serious inconvenience. The contents were turbid as seen through the walls of the bleb.

I have no evidence to offer as to the definite histological changes which occur in such cases. I can find none.¹

¹Since writing the above I have seen two articles on the subject in *Zehender's Klin. Monatsbl.*, 1885. Dr. Th. Gelpke in describing the microscopical appearance of conjunctival and associated tissues altered by pemphigus, says: 'There was no trace of any normal conjunctiva; the tarsal glands could only be seen at the lid borders.'

Dr. E. Bäumler in the same journal, describing the microscopical appearance of an abscessed cornea which had suffered from pemphigus, says: 'The cornea varied in thickness. The corneal epithelium proper was absent and so was Bowman's mem-

The question of diagnosis in its early stage from the evidence at our disposal must be difficult.

Mr. W. Lang in speaking of the one undisputed case that he presented to the Ophthalmological Society of the United Kingdom confesses that he had not recognized it until Baümeler directed his attention to it.

Landolt in reporting a case says it passed through the hands of Sichel, sen., and Liebreich unrecognized, and adds that having had the opportunity of seeing the patient for several months he was convinced that the case was one of pemphigus. Von Arlt says that one of the cases he refers to had been regarded as an obstinate manifestation of syphilis until it was recognized by a dermatologist.

In the Ophthal. Society of the United Kingdom, Trans. 1886, p. 128, W. Lang, in speaking of Steffan's case, "Only once was a vesicle seen on the conjunctiva and this occurred on the skin-like shrunken lower conjunctival sac." Under these circumstances the diagnosis must be conceded to be difficult. I have no suggestions to make.

As to treatment little or no definite information can be offered, at any rate, such as is based on previous experience. I should say that any measure with the use of which the surgeon is most familiar for the relief of an inflammatory condition of the mucous membrane diluted so as to conform to the super-sensitiveness of the eye would be considered an appropriate treatment, taking as a criterion of applicability that the treatment should leave the patient more comfortable and that independent of any narcotic influence.

Of course if it were possible to anticipate any such disaster as this, any surgical measures having in view the absolute prevention of friction of the lids with the eyeballs during the acute stage would be justifiable.

I have said that my efforts to detach the lids after they

brane. The corneal tissue and Descemet's membrane were present. The cornea was covered with a membrane resembling somewhat conjunctiva but the epithelium corresponding rather to the epithelium of the skin. In all probability these tissue changes vary with different periods of the affection.

completely adhered to the eyeballs were fruitless; and I quote from Messrs. Lang and Jules to show that their experience was the same. Mr. W. Lang says, *loc. cit.*, "unfortunately like some cases of pemphigus"—he was speaking of cases otherwise classified—"it is not amenable to treatment, although every means, both medical and surgical, has been tried, such as transplanting conjunctiva and other mucous membranes into the shrunken conjunctival sacs." M. Jules says in reference to one case: The house surgeon attempted to separate the lids from the globe by incision and performed the operation of peritomy. The operative interference was most pernicious.

I have seen some of the transplantations of mucous membranes for kindred cases at different stages in its history and although they appear well at first, a few months are sufficient to destroy all enthusiasm associated with the hoped for success. Of course this remark does not apply to transplantations for other affections.

THE REVOLUTION IN THE AFTER TREATMENT OF CATARACT OPERATIONS.

BY JULIAN J. CHISOLM, M.D.

SURGEON IN CHARGE OF THE PRESBYTERIAN EYE AND EAR CHARITY HOSPITAL
OF BALTIMORE, MD.

At the meeting of the American Medical Association in May, 1886, at St. Louis, I brought before the ophthalmological section a statement from Dr. Charles Michel, of St. Louis, that he was treating successfully his cataract extraction cases with eyes closed by adhesive strips and in moderately lighted rooms. The section disapproved the plan and advised a continuance of the method in universal use of compress bandages and dark rooms. I informed the section that I would put the proposed method on trial and, would report to the section the next year in Chicago the results of my experiments. That report has been rendered. During the year ninety-eight cataract extractions and sixty-nine iridectomies have been performed with such a percentage of successes as warrants the statement that bandages and dark rooms are not only permanently abandoned at the hospital, but must in the very near future be given up by all ophthalmic surgeons.

During the course of this year's experiments, not only have light isinglass straps superseded the heavy compresses and bandages, but much of the restraint in universal use has been proven useless and arbitrary. Under the belief that when the two lids are made one by the adhesive strap, with the tarsal cartilages acting as splints over the corneal surface, and kept in position by means of the tonic contraction of the palpebral muscle, the eye recently operated upon was thoroughly protected from disturbances, regardless of the movements of the rest of the body, the many restraints in universal practice were one by one abandoned.

First, it was found not necessary to operate in the bed in which the patient was to remain during the after treatment. For this was substituted an operating table of convenient height and width placed near a large window from which good light could be had. This permits the operator to complete the manual to his own satisfaction. When the operation for cataract extraction is smoothly done nine-tenths of the dangers against the restoration of sight are removed.

The next step in the abandoning of restraints was not to put the patients to bed, but to allow them the use of their limbs during the entire treatment. Dr. Michel, the advocate of the light room and light dressing treatment, still adopts the restraints in common use, not allowing his patients to turn from their backs in bed for five days. When at the end of this period their backs were aching he would allow them to turn over on the side opposite to the eye operated upon. I do not put them to bed at all. After the operation I allow them to use a lounge, bed or chair, following their own preferences. They go to bed at their usual bedtime hour, sleeping on any side that is most comfortable, and they dress themselves in the morning before breakfast.

For the past four months I have taken another great step forward, and have released the eye not operated upon from being strapped. This was a bold step in defiance of the theory universally accepted that the movements of the eye when left open must affect the cornea of the other recently cut, and therefore a needful quiet must be secured. However satisfying this theory may be, and we have all adopted it for generations back, the experience at the Presbyterian Eye and Ear Hospital, of Baltimore, has conclusively shown that this restraint was never called for and had never been of any utility, but on the contrary of much annoyance and discomfort.

Thus one by one the old rules of universal adoption have been abandoned, and I may say that now the revolution in the after treatment of cataract cases has become complete.

Hereafter there will be no more bandaging, dark rooms, bed operations, bed restraints, diet lists, isolation or smoked

glasses needed. The years work at the hospital has shown that the red, suffused, watery, sensitive eyes, so constantly seen after cataract operations were made so by the restraining treatment, and were not necessary accompaniments of the convalescence. Thick bandages, dark rooms, and restraint in bed caused most of these annoyances. When cataract extractions are treated with a very thin, light colored isinglass strip over one eye as the sole dressing, leaving the other eye open, the patient allowed to enjoy in his chamber the light to which he is daily accustomed, the strap removed at the end of the fifth day, when the corneal wound is perfectly healed, very little sensitiveness or congestion or watering will be found. Convalescence is in this way very much expedited. At the end of the first week the patient can be allowed the privilege of the entire house, and before the two weeks are finished he will be ready for dismissal, with eyes so strong as to need but little protection from smoked glasses.

The fruits of my early experiments were given to the profession in June last, with reasons for the change in treatment. These were deemed satisfactory by many specialists who upon my recommendation determined to try the new plan for themselves. At the Chicago meeting, June 7, 1887, many were found in the section who were as enthusiastic as myself over the new after-treatment. Several had used the isinglass strap and light rooms, and expressed themselves as delighted at the beautiful results secured. At my suggestion they have promised to test equally the no bed treatment leaving one eye open for the guidance of the patient, so as really to remove all restraint. This is to be the dressing of the future and is an immense advance over the blind groping of both patient and surgeon as now conducted.

My present improved practice is to treat the wound made in the extraction of cataract if as it were an ordinary corneal wound such as we daily see resulting from accident. Close the eye with a piece of isinglass plaster and restrict the patient to his chamber for a few days.

What a change is this over the course still adhered to by

some as expressed at the Chicago meeting. First preparation of patient, then operating in the bed, the carefully and thoroughly excluding light from both eyes with compresses and head bandages, in a dark room, then restraint in bed, patients not allowed to talk to friends or to eat solid food, must stay on their back even with hands tied to prevent an accidental touching of the eyes while asleep, and this cruelty kept up for days in the name of progressive surgery. To be sure such statements only came from old practitioners who had been so long running in this deep rut that they could not get out of it, and yet up to one year since this was orthodox practice, sanctioned by every authority on cataract operations.

The work at the Presbyterian Eye and Ear Charity Hospital for the past year has broken the spell and a number of specialists who have tested successfully the new plan have renounced altogether the old method. From present appearances it would look as if the dark room and confining after treatment of cataract and iridectomy cases will soon be assigned to the shelves of a surgical museum, and all such patients will be allowed to enjoy the blessed light of day throughout their entire treatment, for their own immediate benefit and also for the comfort of the attendants.

A CASE OF SPONTANEOUS ABSORPTION OF A
SENILE CATARACT, WITHOUT INJURY TO
THE CAPSULE OF THE LENS—RESTO-
RATION OF EXCELLENT VISION.

BY CHARLES J. KIPP, M.D., OF NEWARK, N. J.

It is a well known fact that soft cataracts are occasionally absorbed without the aid of the surgeon. It is also well known that a hard cataract undergoes retrogressive changes in its cortical layers after a certain period of its existence. These changes not unfrequently cause the cortex to become fluid and to be partially absorbed and the hard nucleus to sink by its own weight to the bottom of the capsular sac (Morgagnian cataract). Ordinarily the fluid cortex remains opaque, but occasionally it is changed into a transparent fluid. (See case reported by Dr. G. A. Nordmann in the *Archives of Ophthalmology*, Vol. xiv, p. 258), and under these circumstances considerable improvement of vision will result. As a rule, these retrogressive changes are accompanied by the development of dense white spots on the inner surface of the capsule. It is also generally conceded, I think, that the complete absorption of the lens, transparent or opaque, of a person over 35 years of age (the period of life at which the nucleus is said to begin to harden), sometimes results from a wound of its capsule. I myself have observed this in several aged persons. The possibility of the spontaneous complete absorption of a senile (nucleo-cortical) cataract, without injury of the capsule was, however, generally denied till Brettauer,¹ of Trieste, Austria,

¹Bericht über die 17te Versammlung der Ophthalmologischen Gesellschaft, Heidelberg, 1885, page 47.

at the meeting of the German Ophthalmological Society at Heidelberg last year, reported three cases in which this event had occurred. To these cases, which are the only authentic cases on record, I can now add the following :

John E. Dietz a carrier, now living at No. 178 Brun street, Newark, N. J., was first seen by me on November 11, 1873. At that time he was 55 years of age, and in good health. His urine contained no sugar. He had a nucleo-cortical cataract in each eye. The cataract in the left eye was fully mature ; that of the right eye nearly ripe. Failure of sight was first noticed in both eyes six or seven months before. The eyes were otherwise healthy. Perception of light and projection good in both eyes. I extracted the cataract of the left eye by v. Graefe's method on November 18, 1873. The wound healed rapidly and three weeks after the operation the sight of this eye with a $+1/_{3.5}$ lens was $15/_{x1}$. He was able to read Jaeger No. 1 with a $+1/_{2.5}$ glass. Two months later I made another examination of the eyes, and found them in the condition last mentioned. After that the patient passed out of my sight, and I should probably never have seen him again if my friend and colleague, Dr. Wm. Rankin, jr., who had assisted me in the operation on the man's left eye, had not kindly called my attention to the present condition of the man's eyes. Having made application for an increase of pension on account of impairment of sight he was sent to Dr. Rankin for an examination of his eyes in November, 1885. The doctor, to his great surprise, found that although the eye bore no evidence that an operation had been made on it, the cataract had disappeared. With a cataract glass before this eye, its sight was excellent and somewhat better than that of the eye operated on by me thirteen years ago. Shortly after this I sent for the man and on inquiry learned that no one had touched his eyes since I operated on his left eye, and that the right eye had sustained no injury of any kind. He remembered to have struck his head against a lamp-post soon after the left eye was operated upon, but the injury was not sufficient to lay him up for even a day. It had, apparently, no influence

on his right. During the last few years he had noticed some improvement in the sight of the right eye, but as he had never tried the sight of this eye with the correct glass before it, was not aware that he was able to see print with it till he was examined by Dr. Rankin. On examination I found that his right eye with a $+1/_{3.5}$ lens before it was $18/_{xxx}$. The sight of the left eye, the one operated on by me, was $18/_{1x}$. In this eye there was some thickened capsule in the centre of the pupil. With a $+1/_{2.5}$ glass he could read the smallest print with both eyes. The right eye was perfectly normal anteriorly. No scar could be found in the cornea or in the sclerotic. The anterior chamber was very deep. The iris was intact but trembled very much on the slightest motion of the eye. Its color was the same as that of the other eye. The pupil was small, free and active. After dilating the pupil with atropine, the examination by oblique illumination showed that of the cataractous lens nothing but its capsule remained. This was intact, and apparently attached all around to the suspensory ligament of the lens. It was very thin and transparent¹ except in its lower portion, where a small, very white, opaque mass was adherent to its inner surface. The capsule was as tremulous as the iris. The ophthalmoscopic examination showed the refraction of the eye to be highly hypermetropic. The vitreous body was perfectly transparent; no floating opacities could be discovered. The optic disk and the retina exhibited no sign of disease. I may also mention that the tension of the eye was normal and that the field of vision was intact.

The cases observed by Brettauer are of the greatest interest and I shall therefore give an abstract of them for the benefit of those who are unable to read the original.

CASE I. J. L., æt. 45, was first seen March 20, 1862. Mature cataract in right eye; half mature cataract in left eye. Flap extraction of cataract of right eye March 26, 1862. Result good. Patient was seen again in 1871. Examination of

¹Since the above was written I have shown the case to Drs. E. G. Loring and Emil Gruening, of New York City, both of whom were unable to determine whether or not the capsule had been ruptured.

left eye revealed slightly tremulous iris and greenish discoloration of this membrane. (The iris of the other eye was light brown). Pupil round and active. In the pupil was seen a membranous mass with an irregular, star-like opacity in it. Atropine produced maximum dilatation of the pupil, and then there were seen radiating from the centre of this membrane grayish-white stripes, corresponding nearly to the sectors of the lens to which were attached a number of cholesterol crystals, like gold tinsel hanging from the branches of a Christmas-tree, which trembled on the slightest motion of the eye. The spaces between the opaque stripes now filled with a gelatinous mass into which the whole lens seemed to be transformed. A nucleus could not be seen. A careful examination showed that the posterior capsule had advanced forward up to the anterior capsule which was intact. In the anterior part of the vitreous body were several pretty large floating opacities. The retina and the optic disk could be plainly seen with the ophthalmoscope. The disk was slightly hyperæmic, and on its outer side there was a slight conus, in size about one-sixth the diameter of the disk. Prof. Becker, of Heidelberg, saw the patient for the first time in September, 1872. The opaque stripes beforementioned cleared up gradually and the cholesterol crystals decreased in number. On March 22, 1874, I noted the acuity of vision of the left eye as $\frac{20}{50}$ with a $+ \frac{1}{6}$ glass. The slightest variation in the distance between the eye and the glass diminished the acuity of vision, and there was therefore not a trace of the accommodation remaining. At the last examination (August, 1885) I found the anterior chambers very deep and the iris very tremulous. Only one broad opaque stripe remained, it was situated immediately below the capsule, and extended from above and inward to the centre. The entire capsular sac, which may be compared to the skin of a pressed-out grape berry, was more tremulous than formerly. In the greatly dilated pupil (atropine) there was seen in the lower outer quadrant a narrow, crescent-shaped space which was of a brighter red than the rest when light was thrown into the eye by the ophthalmoscope. Evidently,

the uninjured capsular sac had here become separated from the zonula of Zinn, since the examination in April, 1885, and then gave rise to the same ophthalmoscopic appearance that is seen in luxation of the lens. The patient was unable to state when he first noticed an improvement in his sight, but he denied positively that the eye had sustained a traumatic injury, and the examination failed to discover a scar or a rent either in the cornea, iris or the capsule of the lens.

CASE II. G. H., æt. 50, mature nucleo-cortical cataract in right eye; not fully mature cataract in left eye. Extraction of cataract of right eye by v. Graefe's method March 16, 1867. Result: S ⁶_{xxiv} with + 3¹/₂ glass. In 1881 patient stopped me in the street, and told me that he was beginning to see again with the left eye. An examination made at this time showed normal cornea, somewhat deep anterior chamber, slight tremulousness of iris, the anterior capsule was intact. The lens contained numerous cholesterin crystals which trembled on movement of eye without, however, changing their places. The crystals seemed to be suspended in a semi-fluid mass of jelly-like consistency. When the patient looked downward a white lenticular body of about the size of a hemp seed came into view, which was evidently the remains of the nucleus. The ophthalmoscopic examination showed paleness of optic disk and a very narrow conus on its outer side. S with +¹/_{3.5} ⁶_{xxxvi}. In October, 1885, the remnant of the nucleus could no longer be found, but there was now in this case also a small free space between the lower margin of the capsule and the zonula of Zinn.

CASE III. Mrs. N. M., æt. 48, at the time I extracted a nucleo-cortical cataract from the right eye, October 15, 1871. Result of operation, with a +¹/_{3.5}, S ⁶_{ix}: There was also a ripe cataract in the left eye at this time. In 1884 she began to see again with the left eye, and an examination of the eye showed normal cornea, anterior chamber and iris. The pupil which atropine dilated *ad maximum* was almost entirely black, excepting innumerable white points which were recognized at once as crystals of cholestearin and were scattered throughout

the lens; they were suspended in a transparent gelatinous mass and trembled, without, however, changing their places on movements of the eye. If the patient looked downward, a white, spindle-shaped body, apparently about 3 mm. long and 1.5 mm. thick, was seen behind the iris in this closed capsular sac. When the patient suddenly looked upward, this body flew up to the middle of the pupil. It was evidently the remainder of a nearly absorbed nucleus. The vitreous body was clear and the fundus oculi normal. In the latter part of August, 1885, the nucleus had entirely disappeared. With a $+1\frac{1}{3.5}$ glass the vision of this eye was $\frac{6}{10}$. The three cases here reported were shown to and examined by Prof. O. Becker and Dr. Goldzicher, of Pesth, in April, 1885.

These cases and my own show conclusively that the total absorption of a hard cataract is possible. The circumstances favoring the absorption remain, however, to be investigated.

RUPTURE OF THE OPTIC NERVE AT THE CHIASM.

BY M. H. POST, M. D., ST. LOUIS, MO.

July 27, 1886, Frank A., colored, about 23 years of age while dodging about a carriage in play with another colored boy struck his eye violently against the fender of one of the wheels.

Dr. Paul Y. Tupper was called and after doing what was immediately necessary sent the case to me.

When I first saw him there was considerable pain; the hæmorrhage had almost stopped; the eye was hanging by a large amount of tissue just outside the palpebral opening.

Upon examining more closely I found that the fender had struck the lower lid just above the orbital ridge of the superior maxillary bone, the force of the blow not only dislocating the globe but also rupturing both lids at the inner angle vertically, the wound of the lower lid being the more extensive.

A 5% solution of cocaine muriate was at once dropped upon the conjunctiva and other exposed tissues. Under its influence, without paining the patient, I was able to snip away the muscles and conjunctiva till the eye was held only by the optic nerve.

Preparatory to cutting the nerve I seized the globe with a pair of fixation forceps and used gentle traction. My surprise may be imagined when the eye came out bringing with it a little more than two inches of the optic nerve, it having been ruptured at or near the chiasm.

The wounds of the lids were stitched up, the patient sent home and put to bed; a mercurial purgative administered, iced applications made and the case watched carefully for cerebral complications, but none arose and a perfect recovery was made.

HYPOPYON KERATITIS TREATED BY FREQUENT IRRIGATIONS WITH SUBLIMATE.¹

BY F. C. HOTZ, M. D., CHICAGO, ILL.

Since it is an undoubted fact that progressive suppuration is caused by infection and kept up by the action of micro-organisms, the quicker these are destroyed, the quicker we shall arrest the destructive suppuration. For this reason galvano-cautery has become such a favorite with ophthalmic surgeons; and certainly it has achieved better results than any other mode of treatment of these cases. But it requires an expert to apply it; it looks frightful to the patient and may easily impress upon him the idea—should the case do badly—that the burning has done it; and lastly, the cautery destroying a certain amount of corneal tissue adds to the loss of substance and to the size of the resulting scar; besides it has no direct effect upon the micro-organisms which may have passed through the cornea into the outer chamber.

I therefore tried to answer the question whether we cannot accomplish the desired effect (prompt destruction of the infectious germs) by a simpler, less heroic treatment than cauterization; and the clinical experiments made during last winter seem to show that the following treatment is very efficient:

The eye affected with suppurative ulcer of the cornea is thoroughly washed with a solution of corrosive sublimate (1:5,000); then both eyes are covered with compresses wrung out of the sublimate; every half hour or hour (according to the extent of the suppuration) the bandage is removed and the eye irrigated

¹Abstract of a paper read before the Section on Ophthalmology at the meeting of the American Medical Association at Chicago.

with the solution. In doing so the patient throws his head well back, the upper lid is raised and held by the finger and sufficient solution is dropped into the eye to immerse the cornea; this position must be kept at least one minute; then compresses and bandage are reapplied.

In twenty-four hours there are always signs of improvement. The frequency of the irrigations is then reduced to once in two hours, and so on, until the ulcer is healed.

Rapid healing, smooth, translucent scars, small loss of tissue were noticed; in no case perforation occurred after this treatment was begun, although in several cases the destruction had reached Descemet's membrane, when the patient came under treatment.

This treatment can be carried out by anyone who is once shown the proper way of irrigating the eye.

TRANSLATION

IMPAIRMENT OF VISION AFTER THE APPLICATION OF GALVANO-CAUTERY TO THE NASAL CAVITY.

BY DR. ZIEM OF DANZIG.

Hirschberg's Centralblatt fuer prakt. Augenheilkde.

The following is part of an article on the above subject :

CASE I.—During the summer of 1879 I destroyed a hypertrophic portion of the nasal mucous membrane at the posterior end of both lower conchæ under guidance of the rhinoscopic mirror by means of galvano-cautery in a patient 41 years of age, who suffered besides from vaso-motor troubles and especially from palpitation of the heart which was not due to any organic lesion. Very soon after a new swelling appeared at the posterior end of the right middle concha which was cauterized also. When I saw the patient a few days later, he complained of impaired vision in the right eye. With a +4.5 sph. V. R.= $\frac{20}{40}$ \, L. E. with +4.0 almost $\frac{20}{40}$ \. The right optic papilla showed well pronounced venous pulsation; on the left nothing of the kind could be recognized. The right field of vision was found somewhat contracted when compared with that of the left eye.

CASE II.—July, 1879, I was consulted by a lady 25 years of age on account of an erectile tumor at the left inner canthus, which took up the area of the two lachrymal canaliculi, had a nodular surface, was somewhat pigmented and showed several fine hairs. This abnormal condition is said to have existed since her birth, but to have grown more after her last confine-

ment. The tears run freely from the eye, and the lids are glued together in the morning. The mucous membrane of the nose on that side is swollen considerably. The removal of the diseased portion of the skin by the knife had been recommended to her by somebody else. Being satisfied that, in order to perfectly remove this congenital angioma which by the pressure during labor had considerably increased, it would be necessary to re-establish normal breathing through the nose as well as a normal circulation in the whole region of the diseased portion, I first cauterized the swollen nasal mucous membrane extensively with the galvano-cauter. During this procedure the patient grew very pale and almost fainted, and at the same time the tumor at the inner canthus collapsed considerably. During the following days the tumor was repeatedly punctured with a very fine galvano-cautery, and thus the tumor removed in such a perfect manner that she was hardly recognized at the clinic where she had first applied for help, and where I had sent her now to get a pair of protective spectacles. This was occasioned by the fact that soon after the operations she had noticed an impairment of vision in her left eye. Ophthalmoscopic examination had revealed a considerable venous hyperæmia of the optic papilla. I know nothing further of the case.

CASE III.—In October, 1883, a lady, 24 years of age, came under my care on account of blepharadenitis, and a sensation of pressure in the eyes. She had also, as is so often the case in such patients, a considerable swelling of the nasal mucous membrane at the anterior end of the lower conchæ. I cauterized these; the left one in the common way avoiding a hæmorrhage; on the right side, however, I purposely removed the galvano-cauter, or rather tore it off, only after it had become firmly adherent. In this way, of course, a hæmorrhage ensued which was the more considerable, since the patient had a general disposition to bleed. After the operation, the left eye showed an increased tension to the examining finger, when compared with the right which felt immediately very much relieved. With the ophthalmoscope a strong venous pulsation was visible on the left optic papilla, while the right

one was normal. I am sorry I did not at once examine the visual acuity and the range of accommodation of the left eye. When I examined her a fortnight after the operation, I found things in the same condition as before it (R. E. V. = $\frac{1}{iv}$, L. E. with -1.0 cyl. A. cor. V. almost $\frac{1}{iv}$); the venous pulsation on the left optic papilla was then no longer present.

The cases here reported teach us that it is not necessary to use the galvanocautery very energetically on the nasal mucous membrane in order to produce an altered circulation within the eyeball, and even an impairment of vision, at least where there exists a disease of or an alteration in the circulation, and more especially where there is a disposition to vaso-motor disturbances. Opinions may differ whether our second case may fairly be counted here. It might be claimed that the impairment of vision which came on after the operation was rather the consequence of the destruction of the erectile tumor at the inner canthus than of the cauterization of the nasal mucous membrane. This might be possible, but supposing that the destruction of the angioma alone or in the main caused the impairment of vision and the venous hyperæmia of the optic disk, we would have to assume a similar mode of development for it as in the remaining cases. In case I. we found after the cauterization of the posterior end of the lower concha a swelling at the posterior end of the middle one, and after the cauterization of this a hyperæmia and venous pulsation on the optic papilla. In the third case the hyperæmia and venous pulsation on the papilla developed only on that side on which the nasal mucous membrane had been cauterized in the common manner without causing a hæmorrhage. This case, however, was not examined in such a perfect manner as to give a satisfactory explanation of the way in which the hyperæmia on the papilla came about. Yet, since the venous pulsation on the papilla did no longer exist a fortnight after the operation, we may be justified in assuming that it was not there before the operation, and therefore a direct consequence of the latter. We have, however, made no exact examination of the range of accommodation and of the visual

field immediately before and after the cauterization, nor after some time had elapsed. I do not think I will ever be able to clear up these points in a similar case, since I have gradually come to the conviction that the galvano-cauterization of a swollen nasal mucous membrane is not only in a vast majority of the cases superfluous, at least if we take care of the causes and remove them, but even that this operation may produce a number of disastrous results. In some other papers I have related other cases to show that cauterization of the nasal mucous membrane by means of the platinum burner causes a more or less pronounced congestion in the neighboring areas of circulation, as in the skin of the cheek, the mucous membrane of the middle ear, the maxillary cavity, the frontal sinus, even in the meninges, and I have there stated it as my opinion that in the cases here related, the impairment of vision was due to a hyperæmia in the erectile organ of the eyeball, the ciliary body. In support of this opinion let me cite the following case: A mariner, 53 years of age, who had lost the right eye with formation of a ciliary staphyloma in consequence of a contusion, consulted me and I found the blind eye neither painful spontaneously nor on pressure. In March, 1879, for reasons that need not here be detailed, I cauterized the considerably swollen mucous membrane of his right nasal cavity. Next day the patient complained of spontaneous pain in the staphylomatous eye and on pressure, which, however, soon disappeared again. There can be hardly a doubt but that the cauterization of the nasal mucous membrane in this case caused a congestion towards the ciliary body. I think this was the same in our third case, in which an increase of intra-ocular tension which was observed right after the operation could only be explained by such a hyperæmia of the ciliary body. On account of the many anastomoses between the bloodvessels of the nasal cavity on the one and the orbit and eyeball on the other hand and in which the *ethmoidales* play the chief role, there can be, anatomically speaking, no obstacle to this assumption. The fact that in the two cases here reported the congestion especially concerned the ciliary body is

simply explained since there was already a *locus minoris resistentiæ*. The blood which by means of the galvano-cautery is suddenly driven from the region operated upon must escape toward a region in which, as a result of existing disease, the resistance of the tissue and especially of the bloodvessels is weakened; thus, in the mariner an injury to the ciliary region had preceded, and in the lady a feeling of tension in the eyeball which evidently resulted from a chronic hyperæmia of the ciliary body was the reason for her consulting me.

Thus, also, in Case I a considerable degree of hypermetropia existed which caused no slight strain of the accommodative apparatus. I do not know whether the quantity of blood contained in the bloodvessels of the ciliary body in highly hypermetropic and highly myopic eyes has ever been satisfactorily inquired into, but I think we might *a priori* expect, that the ciliary body in a hypermetropic eye, since it is continually at work and strained, would in a general way contain more blood than in an eye with a reverse condition of refraction. If in the second case we had confined our operation either to the nasal mucous membrane alone, or to the angioma alone, we might certainly have expected a considerable congestion towards the other untouched organ as being the nearest and most vascular. The double cauterization, however, could not but drive the blood to the elastic tissue of the ciliary plexus. I think in all of these cases we have to lay especial stress upon this elasticity and erectility of the ciliary plexus. The ciliary body of the eye, like the cavernous tissue of the nasal mucous membrane, of the genital organs, the choroidal plexus in the ventricles of the brain, the comb of the rooster, etc., etc., is erectile tissue; this has been successfully proven ten years ago by A. Weber.

In the normal condition such an acute congestion of the ciliary body is easily and speedily adjusted. Things lie differently, however, where there is already an abnormally large quantity of blood; if in such a case the quantity of blood is suddenly increased, it will cause an overstretching and consequent relaxation of the walls of the erectile tissue, and thus

an important factor for the removal of the blood, the contractility of the bloodvessels is eliminated. An increase in the blood-pressure of the ciliary body will make itself felt in the vitreous body, and the increased pressure in the vitreous body may, in the manner which Donders has fully explained, cause venous pulsation on the optic papilla.

The observations here reported and others have caused me to dispense almost altogether with the galvano-cautery of the nasal mucous membrane. Although I have in different eye affections, when there was at the same time a swelling of the nasal mucous membrane had a series of happy, even brilliant successes by "galvanocaustic bleeding" of the nasal mucous membrane, that is by tearing off forcibly the burner when tightly stuck to the tissues, the same results may be obtained in a much simpler way by the application of leeches to the nasal mucous membrane and by scarifications. These methods have long been recommended by Hyrtl and Peter Frank in the treatment of severe eye affections, and they are equally successful.

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There are fifty-four papers promised, an excess of material which the section in six days work cannot dispose of so that no more than one-half of these papers can be used. It is seen from the list of officers, all of whom will be present and will contribute papers, that the section promises a rich treat to all who propose to attend, and that the fullest success is promised. All the sections are fully up to the standard of the Ophthalmological Section. The number of the leading medical men of Europe who have accepted positions in the Congress and who have expressed their intention of being present in Washington will make of this Congress by far the most brilliant assemblage of medical men that has ever been gathered together. The success of the Congress is more than assured now for the meeting in Washington in September.

SOME OF THE SUBJECTS OF PAPERS TO BE READ BY THE
AUTHORS.

EUROPEAN.

- Prof. L. DeWecker - - - Paris, France
Effusions in the Sheath of the Optic Nerve.
- Prof. J. Hirschberg - - - Berlin, Germany
Measuring and Operative Correction of Squint.
- Prof. Galezowski - - - Paris, France
The Operation of Cataract and the After Treatment.
- H. Power, Esq., F.R.C.S. - - London, England
Microbes in the Development of Eye Diseases.
- Dr. Ole Bull - - - Christiania, Sweden
Pathological Changes in Retinal Vessels.
- Dr. A. Mooren - - - Düsseldorf, Germany
Eye Troubles in their Relation to Occipital Disease.
- Dr. L. Landolt - - - Paris, France
Operations for Strabismus.
- W. A. Brailey, Esq. - - - London, England
Remarks on the Operative Treatment of Glaucoma.
- Dr. Moura - - - Rio Janeiro, Brazil
Glaucoma in the Negro Race.
- Dr. A. Gayet - - - Lyons, France
Ocular Asepsis.
- P. H. Mules, Esq. - - - Manchester, England
Exiscration and the Artificial Vitreous.
- Dr. J. Samelsohn - - - Cologne, Germany
Detachment of the Retina, Its Pathology and Treatment.
- J. Richardson Cross, Esq. - - Bristol, England
Retinoscopy.
- Dr. A. Mooren - - - Düsseldorf, Germany
The Most Simple Method of Cataract Operation.

The remaining papers, forty in number, are from leading eye surgeons of the United States.

REVIEWS.

A THEORETICAL AND PRACTICAL TREATISE ON ASTIGMATISM.

By Swan M. Burnett. St. Louis: J. H. Chambers & Co. 1887. With fifty-nine diagrams and illustrations. Price \$3.50.

Dr. Burnett's book is one which we are sure is bound to have a wide circulation on account of its perspicuity and completeness. Such a treatise has indeed been wanting, and we are sure it will be well received by the profession, as it deals thoroughly with astigmatism from all standpoints. The numerous, partly original, illustrations are of such a nature as to enhance the value of the book considerably. It has, furthermore, a very complete list of the literature on the subject and statistics of 806 astigmatic eyes.

Dr. Burnett's name and work is well and favorably known to our colleagues. We trust it needs only a few words as an announcement of the book. That it will prove of great interest and value to the teacher as well as the scholar we have no doubt.

THE NORMAL AND PATHOLOGICAL HISTOLOGY OF THE HUMAN EYE AND EYELIDS. By C. Fred. Pollok. With 230 original drawings by the author. London: J. and A. Churchill. 1886.

The author gives in a very short and often, it seems, decidedly insufficient way the histological conditions of the different membranes of the eyeball and the eyelids in health and disease, and a short chapter on the development of the eye. This description forms, so to speak, the text explaining the plates which take up the larger portion of the volume. We have not been able to detect anything new or original in this work which appears to be largely a repetition of what has

been published elsewhere. The plates, partially in black and white, partially tinted, contain a number of well drawn illustrations; a number of them are decidedly poor and of little value (see for instance illustrations on plate xxxv). A large number which are merely repetitions might have been left out, as being of no additional interest, and thus the high price of the book (\$6) might have been reduced. The reason of existence for this book, since the one given by the author that the literature on this subject, "which is chiefly foreign, is beyond the reach of many" can hardly be considered correct, can only be, *sit venia verbo*, a local one. This seems to be proven by the fact that nothing new is contained in this book and that, as far as we can see, not even an attempt is made to help to fill up the gaps in our present knowledge. In fact, many of the more recent and valuable additions to our knowledge are in no way made use of, as for instance O. Becker's valuable contributions to the formation of cataract, etc.

A PRACTICAL TREATISE ON DISEASES OF THE EYE. By Edouard Meyer, of Paris. Translated from the third edition by Freeland Fergus. Philadelphia: Blakiston, Son & Co. 1887.

This well-known treatise greets us now for the first time in the English language, although its eminent qualities had years ago already led to its translation into five or six other living languages. Its popularity can hardly be less in this new dress than it has been in the older ones, as translator and publishers have evidently done all in their power to do the book justice. Further recommendations would be needless.

UEBER NEURITIS OPTICA; BESONDERS DIE SOGENANNTA STAUNUNGSPAPILLE, UND DEREN ZUSAMMENHANG MIT GEHIRN-AFFECTIONEN. (On neuritis optica, especially the so-called choked-disc, and its connection with brain affections). By R. Deutschmann, Jena: Gustav Fischer. 1887.

The author, whose name is well known and whose merits, especially in experimental pathology of the eye are un-

doubted, in this pamphlet tries to answer finally the mooted question, whether there is really a choked disc, due to the increase of intracranial pressure, or whether what is called choked disc is simply a lower form of optic neuritis. He adduces numerous clinical and pathological observations and a series of rational and successfully performed experiments on animals to prove that an increase of the intracranial (intervaginal) pressure alone is not sufficient to produce a choked disc, since it never reaches that degree of pressure which would be necessary or is at least so to produce that condition by experiment. In this his results are directly opposite to those of Manz and Schulten. The positive results which he came to were obtained by the injection of septic material into the cranial cavity. The choked disc following these injections was always found to be due to the presence of pathogenic germs which, with the cerebro-spinal fluid, had been thrown into the intervaginal space of the optic nerve, had reached its end at the eyeball and being retained there had caused the development of inflammatory symptoms.

It is impossible here to follow the highly interesting deductions more closely. The gist of the pamphlet lies in the following words: "The 'choked disc' is an inflammatory affection. It is not to be considered as the result of a stasis as the Schmidt-Manz theory will have it. On the contrary it is produced by the action of pathogenic agents, whether these are of a chemical or a parasitical nature." We must confess that the deductions have all but won us over to Deutschmann's views. Certainly we can highly recommend the study of this little pamphlet to our readers.

REFRACTION OF THE EYE, ITS DIAGNOSIS AND THE CORRECTION OF ITS ERRORS. By A. Stanford Morton. Third edition. Philadelphia: P. Blakiston, Son & Co. 1886.

The fact that this little book has in its five years of existence already reached its third edition shows that it is appreciated in a high measure among those for whom it is intended. We

are sure this third edition will prove as useful to the student and the general practitioner as did the former ones.

A TREATISE ON DIPHTHERIA, HISTORICALLY AND PRACTICALLY CONSIDERED; Including Croup, Tracheotomy and Intubation. By A. Sanné. Translated, annotated and the surgical anatomy added; illustrated with a full-page colored lithograph and many wood engravings. By Henry Z. Gill. St. Louis: J. H. Chambers & Co. 1887. 665 pages. Price: Cloth, \$5; Sheep, \$6.

We highly recommend this exhaustive volume on a subject of such vital importance to the medical profession. It deals with diphtheria in all its forms, with its history, prophylaxis and treatment in such a manner that it cannot fail to be appreciated by our professional brethren. We think the able translator as well as the publishers are deserving of great success for not having spared any effort to bring this valuable volume creditably before the American public. A.

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No. 7.

A CASE OF ALMOST COMPLETE SELF-ENUCLE- ATION OF BOTH EYEBALLS.

BY JOHN F. FULTON, M. D., PH. D.,

Professor of Ophthalmology and Otology of the St. Paul Medical College.

Month of June, 1884, Dr. Owens, of this city, referred to me a patient who had been sent to him from Winnipeg. He was a man, 38 years of age, with a good family history; up to a few months previous had been a man of good habits. The history of the trouble which resulted in the condition which I am about to describe, is as follows:

He had been on a protracted debauch for several days. While in this condition was arrested and thrown into jail. His attendant found, on going in to him in the morning, that he was completely blind, but nothing seems to have been done for his relief. He was sent to St. Paul two weeks after this, and as stated above was sent to my office by Dr. Owens of this city. Upon examination, I found both eyeballs torn from their sockets, hanging loose in the conjunctival sac. The cornea of both eyes had commenced to slough. The lids were contracted back of the eyeballs. The cilia of the lids were buried by

mucous secretions and tightly adhered to the conjunctiva. The conjunctiva was swollen, thickened, infiltrated, so that it was not easy to differentiate the different parts of the eye. Of course, at first sight it was seen that both eyeballs were entirely destroyed, which had been done by the patient thrusting simultaneously his thumbs into the external canthus of either eye, pushing them backwards to the apex of the orbit and shoving the eyeball violently forward.

The patient was perfectly rational when he came under my care, and gave a perfectly clear, distinct, and apparently reliable history of the whole affair. He was a man of much more than ordinary intelligence, and I have no doubt of the truth of all his statements. In order to spare him from going through the prolonged process of the eyeballs sloughing away, he was advised to have the operation completed, which he had done almost perfectly himself. The conjunctiva was nipped away from the eyeballs with a pair of scissors, the recti muscles were all found to be torn loose, and the optic nerves seemed to have been snapped off close to the commissure.

I am not aware that any case similar to this has been reported in ophthalmological literature. Mr. McKinley, in the recent meeting of the Ophthalmological Association of the United Kingdom, reports a case of a woman, 39 years of age, who had wrenched out one of her eyes with a meat-hook while under the influence of a terrible fit of depression. Mr. McHardy also reports a case somewhat similar to Mr. McKinley's in the last year's meeting of the same society, but almost complete enucleation of both eyeballs done by the individual himself, with no instrument other than his own thumbs, is certainly a unique case in ophthalmological history. The case is not without its practical bearings, as it indicates the care that should be taken of such individuals while in such a condition.

ON PHOTOGRAPHING THE INTERIOR OF THE HUMAN EYEBALL.

BY ELMER BARR, M. D., BUFFALO, N. Y.

Up to the present time, so far as I am able to learn, attempts to photograph the interior of the living human eye have not yielded very encouraging results. In the *Philadelphia Photographer*, of June 5, 1886, Drs. Jackman and Webster, of Coggestall, Essex, England, give the results of their experiments. They succeeded in showing the end of the optic nerve and an indistinct outline of a part of one or two large vessels.

The chief difficulty in obtaining a photograph of the interior of the eye, lies in the fact that the light reflected from the fundus consists almost entirely of red light; and it is well known that ordinary photographic plates are but slightly sensitive to red.

It occurred to me that it would be an improvement to use ortho-chromatic dry plates. With this idea I began experimenting to obtain a photograph of the interior of the living human eye, and the results are better than any others I have seen, showing the optic nerve and vessels quite well.

An ortho-chromatic dry plate is one which by a special treatment is rendered sensitive to green, yellow and red; the aim in artistic photography being to show the true gradation of tone in a photograph of an object reflecting these colors.

I first tried commercial ortho-chromatic plates, and although more sensitive to green and yellow, such a long exposure was necessary for them to be affected by red that it was impracticable to use them.

I then began experimenting with various formulæ to obtain a plate more sensitive to red, and although the results are

much better than those obtained with the commercial plates, they still fail to show the proper gradation of different depths of red, so that the large dark red vessels are not shown with their true distinctness.

The apparatus I have used is rather crude—being merely a modification of Carter's demonstrating ophthalmoscope—and doubtless better results might be obtained with specially constructed apparatus.

For a source of light an Argand gas burner is placed on one side and about eight inches from the concave reflector; an alum cell is placed before the light to intercept the heat rays. The reflector is of 7-inch focus,¹ and has a central opening of an inch in diameter; it is placed about 24 inches from the eye to be photographed.

About two inches in front of the eye to be operated upon is placed a lens to increase the illumination and to form an aerial image from the rays of light reflected from the interior of the eye. After many trials I decided to use a lens of 2-inch focus, as that gives good illumination and shows more of the fundus than would a lens of longer focus.

Behind the opening in the reflector is placed the camera. The arrangement I use consists of a metal tube carrying a lens, and arranged to slide within another tube having a plate holder at its end; the image is focused by sliding back and forth the tube with the lens.

The lens in the camera has a focus of only three inches, and this I think is important, for it makes a very bright image, and consequently a short exposure—six to ten seconds—is sufficient. The image formed is so small that enlargement is necessary when printing from the negative, but in this process time is not so important an element as when making the exposure, for few persons can hold the eye many seconds without movement.

The plates employed are extra rapid dry plates. They are

¹A reflector of longer focus would be better, as a condenser could then be used in front of the light, thus increasing the illumination.

rendered ortho-chromatic by bathing for one minute in a solution of erythrosin, washed well under the tap and allowed to dry. They must not be used until dry, but as soon after drying as possible, as they keep but a short time.

The erythrosin bath I make as follows :

| | | | | | | |
|---------------------------|---|---|---|---|---|---------------|
| Erythrosin, | - | - | - | - | - | I. |
| Distilled water, | - | - | - | - | - | 1500. |
| Solution silver chloride | | | | | | |
| in ammonia, (gr. xxv.-5j) | - | - | - | - | - | $\frac{1}{3}$ |
| Stronger ammonia, | - | - | - | - | - | I |

Mix.

In developing I use the pyro and ammonia developer, and pour on the bromide and ammonia first, to prevent fogging. Ferrous oxalate developer may be used if the plates are first soaked 30 seconds in

| | | | | | |
|--------------------|---|---|---|---|--------|
| Potassium bromide, | - | - | - | - | gr. lx |
| Ammonia, | - | - | - | - | 5ij |
| Water, | - | - | - | - | 5vj |

Development is commenced in the dark, but after it is well started a red light may be used in which to finish the operation.

The image is so small that details cannot be seen by a weak light so that the operator must judge by the general appearance of the image and by the length of time of development—five to ten minutes—as to when the process is complete.

THE AMERICAN OPHTHALMOLOGICAL SOCIETY.
TWENTY-THIRD ANNUAL MEETING.

The twenty-third annual meeting of the American Ophthalmological Society was held at the Pequot House, New London, Conn., on Wednesday and Thursday, July 20 and 21, 1887.

FIRST DAY.—MORNING SESSION.

The meeting was called to order by the president, Dr. William F. Norris, of Philadelphia.

Under the head of unfinished business the following were elected to membership, Drs. J. B. Emerson, New York; H. F. Hansell, Philadelphia; J. O. Tansley, New York; M. Hayward Post, St. Louis, and Edmund C. Rivers, Denver, Col.

A memoir of Dr. Ezra Dyer, of Newport, R. I., one of the founders of the society, was read by Dr. Hasket Derby, of Boston, and referred to the publication committee.

The death of Dr. William S. Little, of Philadelphia, was also reported.

Report of Thirty-Six Cases of Simple Extraction of Cataract Without Iridectomy. By Dr. C. S. Bull, of New York.

Of these 36 cases 20 were males and 16 females. In 24 the cataract was hard and senile, in 11 it was traumatic and soft or semi-soft, and in one it was of secondary origin. There were corneal maculæ in 3 cases, tremulous iris in 7, old choroiditis in 5, and irido-choroiditis in one. Careful antiseptic precautions were adopted in all the operations.

The operation was done with the patient lying in the bed he was to occupy after the operation. The speculum was employed in every case. The knife was long and narrow, nar-

rower than that of Von Graefe. It was quickly passed across the anterior chamber, the flap measuring about two-fifths of the corneal circumference. Prolapse of the iris did not usually occur but if it did, it was allowed to remain until the extrusion of the lens. The capsule was then opened by a quadrilateral incision and by pressure the lens was caused to pass out of the corneal wound. If reduction of the iris did not occur spontaneously it was reduced with a spatula. All soft lens matter was washed out with the antiseptic solution and one drop of a solution of eserine instilled of the strength of one grain to the ounce of a saturated solution of boracic acid. The lids were then closed and an antiseptic dressing applied. If the eye did well the bandage was not removed for two days, but the eserine solution was instilled twice daily under the bandage. At the end of two days the bandage was removed and the eye washed. The lids were not opened for four days unless there was some indication for it. If at the end of this time the appearance was favorable eserine was reinstalled and the bandage applied for another day when it was removed altogether.

The healing process was usually favorable; there was no suppuration in any case. There were six cases of plastic iritis of a mild type and two cases of irido-cyclitis. In the first thirty cases there was no incarceration of the iris. In the last six cases in the treatment of which the same care was manifested, incarceration occurred in every instance. The average duration of the treatment was a little more than twenty days. A secondary operation, usually a needling or a laceration of the posterior capsule, was required in twelve cases. Prolapse of the vitreous occurred in four cases and dislocation of the lens downward in two cases. Eserine was not used after the healing of the cornea. The degree of acuteness of vision obtained was as follows: $\frac{20}{xxx}$ in 2 cases, $\frac{20}{x1}$ in 8 cases, $\frac{20}{1}$ in 8 cases $\frac{20}{1xx}$ in 10 cases, $\frac{20}{6}$ in 5 cases and $\frac{20}{cc}$ in two cases. In one case the eye was blind before operation as the result of irido-cyclitis.

The technique of the operation is more difficult than where

iridectomy is performed. The knife must pass rapidly in order to prevent injury to the iris. The extraction of the lens is more difficult and the danger of prolapse of the vitreous is more imminent.

DISCUSSION.

Dr. H. Knapp, of New York, had, during the past year, performed Panas' operation sixty-eight times. Following the operation there was mild iritis in three cases, severe iritis with closure of the pupil in one case, protrusion of the iris in three cases, incarceration of the iris without protrusion in two cases, capsulo-iritis in one case, and suppuration in one case. This was secondary to an old disease of the eye. In twenty-seven cases a secondary operation was performed. In one case he performed the operation in a man much addicted to drink. The operation was successful, but there was slight wrinkling of the capsule. In the fourth week a simple division of the capsule was made. For twenty-four hours there was not a trace of reaction. The following night he had an attack of acute iritis with dysentery, and the urine was loaded with albumen. The next day there was circum-corneal injection, and the ball was very hard. Eserine reduced the tension but did not contract the pupilla. On the third day the ball was as hard as it is in any case of acute glaucoma. An iridectomy was then made and the patient recovered.

Report of a Series of One Thousand Successive Cases of Extraction of Cataract with Iridectomy. By Dr. H. Knapp, of New York.

These one thousand cases were operated on during the years from 1866 to 1886. A tabular statement was given showing the results obtained in each series. $V=^{20}_{cc}$ to $^{20}_{xx}$ was considered a good results; $V=^{21}_{cc}$ to $^1_{cc}$ was considered a moderate result and where $V=$ less than $^1_{cc}$, the case was regarded as a failure.

In the first series of cases, the method of extraction was by

a very peripheric section more curved than lineal, with the following results: good, 70% ; moderate, 22% ; failures, 8%. Of the failures 3% were from suppuration. In the second series a peripheric linear section was employed. Results, good, 86% ; moderate, 12% ; failures, 2% , all from suppuration. In the third series, linear section was employed. Results good, 86% ; moderate, 9% , and failures 5% , 3% of which were due to suppuration. The fourth and fifth series were performed by peripheric linear section with removal of the anterior capsule. Results, good, 82% ; moderate, 5% , and failures 11.5% , of which 8.5% were due to suppuration. In the sixth series, in which peripheric linear incision with peripheric capsulotomy was performed, the results were, good, 89% ; moderate 1% , and failures 10% , of which 8% were due to suppuration. The seventh series was operated on by the same method only the section was less peripheral. Results good, 88% ; moderate, 7% ; and failures, 5% , of which 2% were due to suppuration. The eighth series was operated on by circular marginal section with peripheric capsulotomy and with antiseptic precautions. Results: Good, 90% ; moderate, 8% , and failures 2% , of which 1% was due to suppuration. The ninth and tenth series of cases were operated on in the same way with the following results: Good, 90.5% ; moderate, 5.5% ; failures, 4% , of which 3% were due to suppuration. The results obtained, taking the one thousand cases as a whole, were: Good, 85.2% ; moderate, 9% ; failures, 5.93% , of which 3.8% were due to suppuration.

Does Sunstroke Affect the Sight Permanently? By Dr. J. A. Spalding, of Portland.

The author introduced the question of the permanent effects of insolation (or sunstroke) upon vision. So many pension claimants were now coming forward, asserting that they suffered from sunstroke and permanent loss of sight in the army, and finally became more or less blind, that it is quite desirable for the expert in examining such cases to be supported by greater authority than he is likely to discover in any text-

books or accessible literature. In point of fact, there has never been reported in the vast extent of ophthalmic literature but a single undeniable case in which sunstroke has been followed by permanent blindness, and only six others in which the eyes were ophthalmoscopically examined soon after the attack. In all of these optic neuritis was distinctly marked, and in several vision was reduced to a low degree; yet ultimately, all six recovered perfect vision without much if any treatment.

Two or three cases illustrative of the assertions of pension claimants were presented in the paper, and the precise reasons for granting or not granting a pension were reported in full. Judging from the history of these cases insolation had nothing whatever to do with the loss of sight; whilst from historical and scientific records it appears extremely doubtful whether the disease ever has any permanent effects on the sight.

The frequent allegations of patients losing their sight during a sunstroke or of "a dimness coming over their eyes" are simply descriptive of the incipient stage of unconsciousness and are untruthful in a scientific point of view. These recollections become in later years the basis of pension claimants' assertions that their vision was seriously affected by sunstroke.

Dr. Spalding expressed the opinion that these were false, and hoped that the members would support expert examiners against the insults of politicians and claimant's friends in refusing to grant pensions for asserted blindness fifteen or twenty years after a sunstroke.

A Case of Probable Quinine Amaurosis. By Dr. D. B. St. John Roosa, of New York.

The patient was a young lady who had been living in a malarious district. While in Washington she had an attack of intermittent fever. Some time after this she was seized with convulsions and unconsciousness. It was believed to be a case of malarial coma, and thirty grains of sulphate of quinine were administered by the rectum on four occasions. On the third

day consciousness was restored, but she was then unable to distinguish light from darkness. The pupils were dilated. She had been taking quinine and iodide of potassium before I saw her, which was October 18, 1886. Vision was slightly recovered and she could count fingers at four feet. On ophthalmoscopic examination the optic papillæ were found small, the vessels very small, but no exudation was seen. Quinine three times a day with a hypodermic injection of strychnia was given. The dose of strychnia was gradually increased to $\frac{1}{24}$ of a grain and kept at that for some time. Vision gradually improved. It was at first eccentric, but by December 10 she had central vision of $\frac{20}{100}$. The papillæ were still white and the vessels small. The treatment was continued. She returned to her home and now states that she can see almost as well as she ever could. The urine was tested in this case several times with negative results.

DISCUSSION.

Dr. Emil Gruening, of New York, remarked that in the latter part of June he saw a lady, 50 years of age, who had been given thirty grains of quinine in one dose. When she awoke in the morning she was blind and deaf. She was deaf for about twelve hours and absolutely blind for twenty-four hours. He saw her about five days after the attack. The fundus was apparently perfectly normal in both eyes. Central vision was normal, but the field was much contracted in all directions. It does not seem that the ischæmia which has been described in the more severe cases should necessarily be present in the lighter cases of quinine amaurosis.

Clinical Contributions to the Study of Ring Scotoma. By Swan M. Burnett, M. D., of Washington.

The speaker gave the histories in full of two cases of ring scotoma which he had followed for the space of two years. In one case there was a history of syphilis and in the other not; in both there was choroiditis with vitreous opacities. In one

case there were no gross changes in the choroid; in the other the changes did not correspond with the defect in the visual field. In one case only one eye was affected; in the other the affection was binocular. In one case the trouble began as a typical right hemianopsia with left semi-annular scotoma. The central clear spot more or less oval in form $10^{\circ} \times 20^{\circ}$ was never through all the changes diminished in size. All who have written on the subject (a full bibliography was appended to the paper) have placed the pathological process inside of the eye, though in none have the changes in the choroid manifest under the microscope been sufficient to warrant such a conclusion, and in none have the changes in the form of the visual field been followed so closely or so long as in these cases, eighteen diagrams of the fields at various times being exhibited. The course of the nerve fibres in the tract, chiasma, and nerve as demonstrated by Bunge, Samelsohn, Leber, Vossius and others particularly in the somewhat analogous condition of central scotoma which in nearly every instance coincided in form and size with the central clear space in these cases, seems to justify the assumption that the fibres supplying the intermediate parts of the retina were hindered in their function either from a localized neuritis or by pressure of the adjoining parts.

DISCUSSION.

Dr. Henry D. Noyes, of New York, reported the case of a young lady, aged 17, who came to him complaining of pain and dimness of sight in one eye. The ophthalmoscope showed no material lesion, but with the perimetre he discovered a ring scotoma. There were no local lesions, no symptoms of brain trouble and no evidences of hysteria. Further examination showed signs of orbital neuritis. He based this view chiefly on the fact that pressure of the globe backward elicited unquestionable pain. This continued for at least two weeks. The ring scotoma subsequently entirely disappeared and vision was restored to the normal. He was satisfied that

ring scotoma may have an extra-ocular origin. When we search for these cases more carefully I think that we shall find that they are not so extremely rare as has been supposed.

Dr. C. S. Bull, of New York, said that some time ago he had reported a case which would come under the same category as those of Dr. Burnett. The patient, a man 36 years of age, when two years of age injured the right side of the skull by a fall. Vision of right eye was impaired and a convergent squint followed. He could count fingers at two feet with the right eye. In 1878, he had a compound depressed fracture over the left parieto-occipital region of the skull. Trephining was resorted to. This was followed by convulsions which have since grown less marked. He noticed that he could not see through a part of the field of the left eye. The ophthalmoscope shows a neuro-retinitis of low grade in the left eye. The field was normal for twenty degrees around the point of fixation. Then there was an irregular defect in the field for fifteen to twenty-five degrees all around, and outside of this the field was normal.

Dr. W. F. Mittendorf, of New York, remarked that attention has recently been called to the fact that peripheral annular scotomata are often present in cases of chronic glaucoma. He had examined five or six cases of glaucoma with this in view, and had found it in one instance.

Dr. O. F. Wadsworth, of Boston, said that a case which he recently published seems to show that the lesion in these cases may be situated in the nerve. A young man, aged 23, was run over by a heavy wagon, one wheel passing over his chest. He was seen forty-eight hours later. There was slight haziness of the retina and some slight, thin hemorrhage in the right retina. There was a central scotoma. In a short time the scotoma resolved itself into a ring scotoma. This condition continued for at least two years afterwards. There was absolutely no ophthalmoscopic change to be detected.

The So-called Orthopædic Treatment of Paralysis of the Ocular Muscles. By Dr. C. S. Bull, of New York.

Reference was made to the fact that the use of galvanism in the treatment of paralysis of the ocular muscles was unsatisfactory on account of the impossibility of localizing the current to the affected muscle. The method of Prof. Michel was then described. In this plan the muscle is seized with fixation forceps and the eyeball moved backward and forward in the direction of the ordinary action of the affected muscle. This procedure produces some pain and slight irritation. The pain is largely relieved by the use of cocaine. The speaker had employed this method in twenty-one cases of ocular paralysis due to various causes. The paralysis was entirely cured in eight cases; partially relieved in seven cases, and in six the treatment was entirely valueless.

Recurrent Paralysis of the Motor Oculi. By Dr. O. F. Wadsworth, of Boston.

The patient was one of twins, Pauline and Francis, born of healthy parents. In June, 1874, when the twins were three years of age, they had scarlet fever, and this was followed by a discharge from the ear. In each case a slight discharge from one ear continued. In 1877 Francis began to complain of headache which recurred frequently until three months later when she had a convulsion. The convulsions were repeated. Six months after the first convulsion she complained that she could not see. Examination showed well-marked optic neuritis. The headache and convulsions gradually ceased, but she remained blind. She was again seen in 1879 and found to be in good health, with the exception of the blindness.

Pauline after the attacks of scarlet fever in 1874, had headache recurring every month or so. On February 24, 1879, she was brought to the hospital with the history that she had suffered with daily pain in the head for two weeks. This was referred to the supra-orbital region. It would commence about noon, then intermit, recur again about 5 o'clock and continue

for several hours. There was vomiting on the first two days of the attack and there was a slight discharge from the right ear. She was seen one month later. The headaches had recurred every two or three days. There was then paralysis of all the branches of the right motor oculi nerve with ptosis and divergence of the right eye. By February, 1887, the headaches had diminished in frequency and for the last few years she has had three or four attacks a year, the more severe being accompanied by ptosis and dilatation of the pupil. It was subsequently learned that with each severe attack there was a free discharge of ill-smelling fluid from the right ear. On May 1 the right ear was examined and a polypus filling the meatus found and removed.

The writer had been able to find only fifteen cases of this affection on record. Of this number four were males and eleven females. The period between the attacks was variable and irregular. In several instances there was evidently a persistence of a certain amount of paralysis between the attacks. This was noted in the case just described. There has been no instance of permanent relief, and three of the cases have terminated fatally.

As to the cause of the affection, the results of the autopsies point to a basal origin. In one case, plastic exudation surrounded the right motor oculi nerve; in another case the right oculo-motor nerve was pressed upon at its point of emergence from the crus cerebri; and in the third case there was a fibro-chondroma which had developed in such a way as to separate the fibres of the right oculo-motor nerve without destroying them. In the case reported, the speaker thought that there was an evident association of the paralysis with the chronic aural trouble.

Hyperemia in Muscular Insufficiency. By J. A. Lippincott, of Pittsburg.

The speaker reported several cases of localized hyperæmia of the eye which he thought were due to weakness of the muscles. The grounds on which he based this view were the form

and location of the spot of hyperæmia and its disappearance along with other evidence of the muscular insufficiency.

The society then adjourned until 8 o'clock in the evening.

EVENING SESSION.

Cases of Acute Primary Glaucoma, of Hæmorrhagic Glaucoma, and of Secondary Glaucoma. By Dr. W. F. Norris of Philadelphia.

CASE I.—A married woman, æt. 52 years, who was admitted to the Will's Eye Hospital with acute glaucoma of the left eye. The attack was of twelve day's duration. Vision was much impaired. The right eye was entirely quiet and presented a narrow iridectomy upwards. In August, 1875, a severe attack of glaucoma had suddenly occurred in the right eye, and on the fifth day iridectomy had been performed. Since then the eye had given no trouble. When admitted to the hospital the patient was in a feeble condition. She was put to bed, a leech applied and eserine instilled. The eye improved and became quieter. The cloudiness of the cornea and the other symptoms remaining, iridectomy was performed twenty-eight days from the commencement of the attack. A year later she had a severe attack of pain not relieved by eserine and sclerotomy was performed. The eye continued to give trouble from time to time, and it finally became necessary to enucleate it.

CASE II.—Primary hæmorrhagic glaucoma. Miss B., aged 70 years, was seen in February, 1867, with marked hæmorrhagic retinitis and incipient cortical cataract. She stated that she had a sudden loss of vision two years previously. The present attack of loss of vision came on suddenly ten days before when the patient was stooping. Examination showed numerous hæmorrhages into the retina. One month later the right eye was more cloudy, the tension increased, and there was some hæmorrhage into the anterior chamber. Iridectomy was then performed. The wound did well until the fourth day, when there was a sudden attack of pain. On the ninth day, apparently without exciting cause, this symptom recurred.

After this there would be an exacerbation every few days. The eye-ball was subsequently enucleated, the patient dying a year or two later with apoplexy.

CASE III.—Secondary glaucoma after successful operation for cataract. A man, aged 66 years, had been operated on for cataract in both eyes sometime before coming under observation. This had been done in England, both operations having been successful. Some eighteen months later, the right eye had been operated on by a needle operation, and since then it had not been free from irritation. When seen the right had lost the perception of light and the left eye presented signs of sympathetic irritation. The right eye was enucleated, and this relieved the irritation in the left eye. The patient now sees fairly well.

A number of micro-photographs showing sections of the eyes removed in these cases were exhibited by means of a lantern.

Dr. B. Alexander Randall Presented the Notes of a Case of Sarcoma of the Eyelid, Simulating a Meibomian Cyst, occurring in a man about 41 years of age, who came under observation in 1885, with the history of two operations in the previous three years for the removal of a cyst. The tumor had the position, size, color and apparent fluctuation of a chalazion, but a vague grayness, suggested pigmentation, and led to its total removal by a V-shaped incision through all the tissues of the lid. Sections proved the tumor to be a solid encapsuled sarcoma of large spindle cells. The patient passed out of sight for two years, and then returned with recurrence very like the original which had been treated in the interim as chalazion. The outer half of the lid had now to be removed and the tumor was found to be of the same nature as before and again encapsuled. The Meibomian glands at both operations seemed to be entirely normal, and the tarsus was entirely uninvolved.

Dr. Randall also presented some ophthalmoscopic cases of *cilio-retinal vessels* with the remark that they were far

from rare and that the occurrence of such an origin of even a principal artery or vein, supplying different quadrants of the retina, had come to notice. As to the origin of these vessels in two cases they could be distinctly seen to join the net work of the choroid. The reported cases examined anatomically have been seen to arise directly from a short ciliary vessel. Photo-micrographs of such a case in the collection of Dr. Wm. F. Norris, were shown.

Dr. Randall also called attention to the *Hohlschnitt* of v. Jaeger in cataract extraction as differing in no way essential from the modified linear operation, except in the knife with which it is made. He asked attention to the knife with the claim that with it almost all the usual modifications of the linear extraction could be made, but that no aqueous need be lost until the completion of the incision, and consequently that the cut could be made more safely and smoothly than was possible with the Graefe knife. As illustrative of the perfection of the healing, he demonstrated a photo-micrograph of a *Hohlschnitt* executed by v. Jaeger himself, which he had prepared in Prof. Arlt's laboratory about a year after the operation.

DISCUSSION.

Dr. H. Knapp, of New York had used Jaeger's knife, but had not found the advantage which the author had claimed. It is simply a modified small Baer's knife. In his experience it has been more difficult to pass a large knife through the anterior chamber than it is to pass a Graefe knife. By practice the section can be completed in one cut by the Graefe knife but he did not consider this necessary.

Dr. H. D. Noyes, of New York, agreed with the last speaker as to the greater facility in passing a narrow knife. A narrow Graefe knife gives better control of the movements necessary in making a proper section than any other knife which he had tried.

Dr. S. Theobald, of Baltimore, thought that probably the greater facility in the use of the narrow knife over the triangular knife may be due to the fact that in using the latter, we are doing two things at once. We are attempting to pass it across the anterior chamber and at the same time to complete the section. With the Graefe knife we transfix the eye and then make the section.

Adjourned.

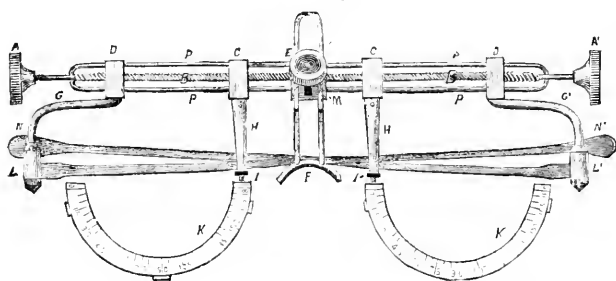
[TO BE CONTINUED.]

DR. L. W. FOX'S TRIAL FRAME.

Manufactured by
THE GENEVA OPTICAL CO., GENEVA, N. Y.

We have received from this enterprising firm a sample of Dr. L. W. Fox's trial frame, and can highly recommend it to our confrères, as being all they claim for it and a decided improvement on their former heavy frame. The following is an accurate description.

FIG. 9.



FRONT VIEW.

In this frame a right and left hand steel screw B B is between two steel rods P P P P. The rods serve as guides to keep the parts in line and secure rigidity and strength.

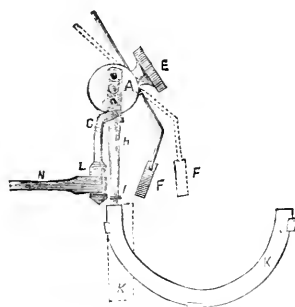
The nose rest F is faced with shell and has movement up and down and in and out as shown in Sectional View, and is clamped in place securely by set-screw E.

The temples N N are hinged to arms G G. The lens-holders K K are attached to lugs C C in such a manner that they swing in a horizontal plane on shanks I I, as shown in Sectional View. This swing motion to the eye allows that without removing the frame from the face, the operator can bring either lens-holder forward to exchange lenses or from in front

of the eye to show the difference with and without lenses, leaving the other eye covered.

The lens-holders K K are each made to receive three lenses or when a desired combination of two has been made they may be left in position and vision cut off by the insertion of the solid disc while testing the other eye.

FIG. 10.



SECTIONAL VIEW.

This frame makes a perfect pupillometer by placing in the back cell of both eyes a metal disc with small hole in the centre then directing the attention of the patient to some object turn the milled heads A A until binocular vision is secured and it seems there is but one hole as the images overlap on the retina. This will give the correct pupillary distance. Then if the nose-rest is adjusted so that when the patient is looking through the holes the nose-rest is where the spectacle frame should be placed, this will give the height of crest of nose above the centers of the lenses, and swing the nose-rest so that the discs are as near the eye as the spectacle lenses should be and the position of the crest of the nose with reference to the plane of the lenses will be given. All these measurements can be read on scales in the box to which the frame can be fitted.

Most of the advantages of the frame can be inferred from the above description. It is very strong and light, weighing but $1\frac{1}{4}$ oz. It can be adjusted to about one-half inch nar-

rower pupillary distance than any other and yet give space for nose; this and the in and out adjustment to the nose-rest are valuable improvements, but it is the 'swing lens-holder' that gives it the greatest advantage over others.

No. 916. Price for Frame, - - - - - \$12 00

“ “ Case with scales for prescribing
measurement of spectacle
frames giving pupillary dis-
tance, height of nose and po-
sition of crest of nose front or
back of plane of lenses, extra, 1 00

In ordering, state if wanted with case or without.

We have also for some time used a set of trial glasses from the same firm, and can highly recommend it.

CORRESPONDENCE.

MINNEAPOLIS, MINN., July 9, 1887.

EDITOR AMERICAN JOURNAL OPHTHALMOLOGY.—In the article "International Congress" in the last number of the AMERICAN JOURNAL OF OPHTHALMOLOGY I find an error which I think should be traced back to from where it emanated and there corrected. Among the members of the council in the Ophthalmological Congress is Dr. Ole Bull, of Christiania, "*Sweden*." We all know that Christiania is the capital of the kingdom of *Norway* and I am sure Dr. Bull would not like to give up his nationality even in an International Congress.

If you would help to have this little error corrected, you would surely oblige Dr. Bull and fifty Norwegian doctors in the Northwest. Yours truly, KARL BENDEKE, M. D.

INTERNATIONAL CONGRESS.

GENERAL PROGRAMME OF THE CONGRESS.

FIRST DAY—MONDAY, SEPTEMBER 5.

The Congress will assemble at Albaugh's Opera House at 11 A. M., and will be formally opened by the President of the United States, to be followed by a short address of welcome by the Secretary of State; address by the president of the Congress; report of secretary-general and chairman of Committee of Arrangements. Adjourn at 1:30 P. M. From 3 to 6 P. M., meeting of the Sections at their respective halls. Evening *conversazione* at U. S. Pension Hall from 8 to 11 P. M.

SECOND DAY—TUESDAY, SEPTEMBER 6.

Meeting at 10 A. M. at Albaugh's Opera House. General addresses by Drs. Flint and Semmola. Sections will meet at 11 A. M., and adjourn at the same hour with Congress at 1 P. M. In the afternoon the Sections will meet from 3 to 6 P. M. In the evening it is expected that a reception will be given by the President of the United States, and the Corcoran Art Gallery will be thrown open to the members and their families.

THIRD DAY—WEDNESDAY, SEPTEMBER 7.

The Congress will meet at 10 A. M. General addresses until 1 P. M. The Sections will meet as usual at 11 A. M., and adjourn at 1 P. M. Afternoon meeting of the Sections from 3 to 6 P. M. Evening reception to the members and their families by the citizens of Washington.

FOURTH DAY—THURSDAY, 8.

General meeting at 10 A. M. Addresses, if not previously delivered. Meeting of the Sections at 11 A. M., adjourn at 1 P. M. Afternoon, Sections meet from 3 to 6 P. M. General reception buffet banquet at U. S. Pension Hall from 8 to 11 P. M.

FIFTH DAY—FRIDAY, 9.

General meeting at 10 A. M. Transaction of business affairs of Congress. Meeting of Sections at 11 A. M., and adjourn at 1 P. M. Afternoon, Sections meeting from 3 to 6 P. M.

SIXTH DAY—SATURDAY, 10.

General meeting at 10 A. M. Adjourn at 11 for visit to Mt. Vernon.

On Sunday or Monday, the day not yet determined upon, an excursion train will leave Washington with the foreign members and their families for Niagara Falls, under the escort of a part of the committee of arrangements, selecting the

route which will afford our foreign brethren an opportunity to see some of the most interesting and thrifty portions of our country, as well as very beautiful scenery.

In completing the details of this programme it may be necessary to make some slight modifications.

ALEX. Y. P. GARNET, M.D.,

Chairman of Committee of Arrangements.

RAILWAY RATES TO WASHINGTON.—The Railroad Associations which have already agreed to make a reduction of fare for members of the Congress and their families on the roads under their control are :

The Trunk Line Association.

The Central Traffic Association.

The Newport News and Mississippi Valley Company.

The Southern Passenger Association.

These cover the greater part of the territory east of the Missouri and Mississippi rivers. The whole list of roads controlled by these associations is too large for publication, but members can obtain all the necessary information by application to the railroad agent at the starting point. It will be required to pay full fare to Washington, and a return will be allowed for "one-third the highest limited fare" on the association's certificate. It will be necessary for these certificates to be procured before starting and have upon them the receipt of the railroad agent for the full fare to Washington. Members intending to attend the Congress should, as soon as possible, make application to the undersigned for blank certificates of the association over whose road they intend to travel, and the blanks will be forwarded at as early a date as they can be obtained. A separate certificate will be required for each person.

J. W. H. LOVEJOY, M.D.,

Chairman Transportation Committee.

No. 900 12th St., Washington, D. C.

DUTY ON EXHIBITS FOR THE CONGRESS.

[The following portion of a letter from the Secretary of the Treasury to Dr. John B. Hamilton, Secretary-General of the Ninth International Medical Congress, is of especial interest to our foreign confrères who wish to attend the Congress:]

The professional books, implements, instruments * * * of persons arriving in the United States are exempt from duty under the provisions of the tariff law, which also provides for the free admission of "models of inventions and other improvements in the arts, such as cannot be fitted for use," and parties arriving from foreign countries for the purpose of attending the Ninth International Medical Congress, to meet at Washington September 5, 1887, and who bring with them their own "surgical or dental instruments, scientific and mechanical appliances, models and materials to be used for clinical demonstration under the direction of said Congress," will be entitled to have the same passed *free of duty*, on the usual oath that they are for their personal use and not intended for sale.

As it would appear from the act of Congress relative to said convention that the Ninth International Medical Congress is a society established for philosophical and scientific purposes—books, maps and charts (not more than two copies in any one invoice), philosophical and scientific apparatus, instruments and preparations, casts, paintings, drawings and etchings, specially imported in good faith for the use of said Congress and not intended for sale, would also seem to be entitled to free entry under the provision of the tariff act now in force, a copy of which is herewith enclosed. (See paragraphs 660, 759 and 815.

Copies of this letter will be transmitted to the collectors at the principal ports for their information and guidance.

Respectfully yours,

(Signed)

C. S. FAIRCHILD,
Secretary of the Treasury.

THE BRITISH MEDICAL ASSOCIATION.

This association holds its fifty-fifth annual meeting at Dublin, August 2, 3, 4 and 5.

The Ophthalmological Section is presided over by the following officers :

President—H. R. Swanzy, M. B. Vice-Presidents, D. Argyll Robertson, Pres. R. C. S., Edin. ; Priestley Smith, M. R. C. S. E. ; Honorary Secretaries, A. H. Benson, M. B., 42 Fitzwilliam Square, Dublin ; A. W. Sanford, M. D., 13 St. Patrick's Place, Cork.

The subject for discussion is The Etiology and Treatment of Convergent Concomitant Strabismus, which will be introduced by Mr. Simeon Snell, of Sheffield. Drs. Jeffreson, Cowell, McHardy, E. Meyer, E. Nettleship, Wood White, P. H. Mules, W. A. Brailey, Vose Solomon, F. Mason, R. Williams, Walter H. Jessop, W. Lang, E. Juler, W. Charnley, Henry Eales, Frank Hodges, F. O'Devaine, and Argyll Robertson will take part in the discussion.

The following papers are promised :

Benson, Arthur H., F. R. C. S., Dublin, on the Treatment of Stenosis of Lachrymal Duct by Removable Styles.

Berry, George, M. B., Edinburgh, on Amblyopia, Diplopia, and the Etiology of Strabismus.

Bickerton, T. H., Esq., Liverpool, on Color-Blindness, with Especial Reference to its Prevalence Among Sailors

Bull, C. S., M. D., New York, (subject of paper not received).

Charnley, W., Esq., A New Point in Astigmatism.

Frost, W. Adams, F. R. C. S., London, on Squint.

Glascott, C. E., M. D., Manchester, (subject of paper not yet received).

Hewetson, H. B., Esq., Leeds, on Amblyopia from Lead-Poisoning (illustrated); nine cases.

Jessop, Walter H., Esq., (subject of paper not received).

Jones, A. Emyris, M. D., Manchester, on Atrophy of the Optic Nerve, Associated with Dropping of Fluid from the Nostril.

Landolt, Dr., Paris, on the Re-establishment of Binocular Vision after Strabismus Operations.

Little, David, M. D., Manchester, Operative Treatment of Lamellar Cataract.

Mules, P. H., M. D., Manchester, on Squint.

Smith, Priestley, Esq., Birmingham, on Neurasthenic Amblyopia.

Taylor, Charles Bell, M. D., F. R. C. S., Ed., Nottingham.
1. Five Hundred Cases of Cataract Extraction without Iridectomy. 2. A New Operation for Internal Squint. 3. On the Treatment of Lachrymal Obstruction without Incising the Canaliculus.

Uhthoff, Dr., Berlin, Demonstrations of Preparations Relating to (1) Chronic Alcoholism, in its Relation to the Eye; (2) Ophthalmoplegia; (3) Paralysis of Orbital Muscles.

Williams, Richard, M. R. C. S., Eng. Liverpool, on the Actual Cautery in the Treatment of Conical Cornea.

Communications have also been promised by Dr. Karl Grossman, Liverpool; Dr. Lloyd Owen, Birmingham; and Mr. E. A. Browne, Liverpool.

THE AMERICAN JOURNAL OF OPHTHALMOLOGY.

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No. 8.

THE PATHOGENESIS OF PTERYGIUM.¹

BY SAMUEL THEOBALD, M.D.

ONE OF THE SURGEONS TO THE BALTIMORE EYE, EAR AND THROAT CHARITY
HOSPITAL.

Although the question of how best to treat pterygium has, from time to time, received considerable attention, but little effort seems to have been made to throw light upon the mode of origin of this by no means uncommon affection. Having had occasion recently, in preparing an article upon pterygium for the forthcoming volume of Wood's Hand-book of the Medical Sciences, to examine the several theories which have been proposed regarding its pathogenesis, I could not but be impressed with the inadequacy of each of them.

It is manifest that any theory which would satisfactorily explain the origin of pterygium must not lose sight of, indeed must account for, the fact that this growth rarely, if ever, makes its appearance except directly over one of the recti muscles and, besides, that it is not found with equal frequency over each of

¹A paper read before the American Ophthalmological Society, July 21, 1887.

these muscles, but in a very large majority of cases is in relationship with the rectus internus. This, however, the theories heretofore advanced fail to do. Take, for example, Arlt's theory, which has been very generally accepted, that pterygium has its starting point in an adhesion between swollen conjunctiva and a marginal corneal ulcer. It is manifest that, if this were the usual method of its production, since marginal ulcers of the cornea are not appreciably more frequent in one direction than in another, we should find pterygia approaching the cornea from every possible direction, and certainly bearing no constant relationship to the position of the recti muscles. The more recently proposed theory of Poncet, that pterygium is a parasitic disease, and that its advance upon the cornea is due to the presence of microbia—parasitic “vibriones” (*sic*)—which are supposed to tunnel their way beneath the corneal epithelium, is, of course, open to the same objection. Moreover, it is to be remarked that pterygium does not, as a rule, begin to form exactly at the corneal margin; but, on the contrary, that it frequently attains considerable size before its apex has even reached this point and, therefore, before the ulcerative process (which Arlt and Poncet agree in regarding as the starting point of the affection) could possibly have played any part in its formation. Such being the case, it is evident that we must seek elsewhere for the primary cause of pterygium than in diseased conditions of the cornea.

It has long been taught that the development of pterygium is favored by conditions which produce persistent hyperæmia of the conjunctiva, as, for example, when the eyes are exposed to the heat of a tropical sun, especially as in long sea voyages, or to the heat from furnaces, as is the case with stokers and founders, or to the irritant action of dust and vapors, as in certain manufacturing establishments; and the evidence in favor of this view is much too strong to be put aside. It is certain, however, that it frequently occurs without the eyes having been subjected to such unusual conditions; and, moreover, though this explanation of the origin of pterygium might account for its

seldom making its appearance above or below the cornea, since in these situations the conjunctiva is more completely protected by the lids from external irritants, it would not account for its occurring so much oftener upon its nasal than upon its temporal border. Assuming, however, that persistent hyperæmia of the conjunctiva is an important factor in the production of pterygium, are there reasons why this condition should occur especially to the nasal side of the cornea—where pterygium usually makes its appearance?

Although the constant relationship between the location of pterygium and the position of the recti muscles, to which reference has been made, would seem to suggest that there is some connection between the two, I am not aware that this idea has been advanced heretofore. It seems to me highly probable, however, in view of the intimate connection between the vascular system of the recti muscles and that of the conjunctiva in the neighborhood of the corneal border (anterior conjunctival vessels of Van Woerden) that these muscles, by influencing the blood supply of the over lying conjunctiva, do, in fact, play a most important role in determining the formation of the pterygium. Supposing that such is the case—that the determination of blood to the recti muscles tends to promote a hyperæmic condition of the over-lying conjunctiva, and that this, in turn, leads to the development of pterygium—it is manifest that of all the straight muscles the interni would exert by far the most decided influence in this respect, for they are not only the largest and the most active, but they lie in closer relationship with the conjunctiva than any of the others, since their attachment to the sclerotic is nearer to the corneal border. Thus we have at once a satisfactory explanation of the fact that pterygium occurs in so large a majority of cases to the nasal side of the cornea.

In support of this view of the causation of pterygium, I may mention, as a matter of observation, that persons who suffer with this affection not infrequently complain that the pterygium itself and the conjunctiva in its neighborhood become blood-shot when the eyes are much used in near work.

What the especial conditions are which bring about this state of localized hyperæmia of the conjunctiva in some eyes, rather than in others, remains to be shown. In some instances it is, perhaps, due to peculiarities in the distribution of the blood-vessels of the muscles and conjunctiva ; but in a greater number I am inclined to think it is dependent upon conditions which disturb the normal relationship between accommodation and convergence, and thus render binocular vision difficult, such as insufficiency of the internal recti muscles and the several varieties of ametropia. I must confess, however, that as my attention has only recently been directed to this point, I have as yet but little clinical evidence to offer in support of it.

ANTIPYRINE AS AN ANALGESIC IN INFLAMMATIONS OF THE EYE.

BY M. H. POST, M.D., ST. LOUIS.

April 11, 1887, Mr. ——— consulted me with a severe double iritis; he had been under the care of a physician before I saw him, but as both pupils were small and bound by numerous posterior synechiæ, and as no applications but cocaine had been made I presume the case had been mistaken for one of neuralgia.

I at once began treating the case energetically with mercury and atropia, with excellent results. The pain, however, continued to increase till finally, having exhausted my other resources I was about to prescribe morphine, when his wife informed me that he could not bear it. "But," she added, "the antipyrine relieved his pain."

Upon inquiry I found that antipyrine had been prescribed by my predecessor, and as the patient still had a powder of 25 grains I told him to take it that night when the pain came on. The next morning he reported that he had passed a very comfortable night. And the appearance of the eye was improved. To satisfy myself of the virtue of the drug, one night I had it omitted, and the pain returned. The case made an excellent and rapid recovery.

Since that time the drug has become a regular part of my treatment of iritis. I have used it in specific and non-specific cases, and thus far it has never disappointed me. I have also used it in pain resulting from ulceration of the cornea, and slowly progressing panophthalmitis, and in these cases, too, it has relieved the pain.

I believe that it also modifies the course of iritis beneficially. Certainly the cases which I have treated in this way have run a shorter course than those I treated under the old method.

My plan is when the patient begins to complain of pain to prescribe $\mathfrak{z}\text{i}$ of antipyrine divided into three or four powders, as I think the severity of the case indicates, with directions to take one powder every two hours till the pain is relieved. I have had cases where the 60 grains were taken in one night; but usually from 15 to 45 grains are sufficient.

TRANSLATION.

We find in the July number of the *Centralblatt fuer praktische Augenheilkunde* the following article by Prof. Jacobson (Koenigsberg).

An Operation for Trichiasis.—The little operation which is here to be described, has been performed more than a hundred times, partly by myself, partly by my assistants, in the polyclinic, Drs. Vossius and Ulrich.

The number of these operations grew rapidly with the increase of the knowledge in what cases it was indicated. The results have been good without exception, incomparably better than those of the method of Jaesche-Arlt. In the hope of making my colleagues acquainted with an operative procedure, with the results of which they will be satisfied, I present the method of operating before going into a more elaborate discussion of it.

Let us assume that there is trichiasis along the left upper eyelid. The operator stands in front of, the assistant behind the patient. The right hand of the assistant directs the horn-spatula of Jaeger, with his left hand he drops during the whole of the operation from a piece of absorbent cotton a solution of boracic acid (of 4%) or of corrosive sublimate (1-2,500) over the wound-surface. The temperature of 35° to 40° Cels., is increased to 50°, if the flap gets very pale.

First step.—Inter-marginal section according to Jaesche-Arlt (more properly according to Aëtius and Paulus, of Ægina) which splits the lid into a lower (tarsal tissue and conjunctiva) and an upper layer (all the soft parts), and which reaches about from 6 to 8 mm. upwards.

Second step.—Delineation with the knife of a thin skin-flap beginning usually from the temporal end of the inter margina,

section and running nearly vertically upward or downward on the skin of the face, or at an obtuse angle on the skin of the temple, or on the skin of the lid (Vossius). After the skin-flap has been loosened to within about 4 mm. from its point, a fine curved needle armed with a silk thread is passed through it from its cutaneous surface, and then the point also is loosened.

Third step.—The flap by means of the silk thread is carefully brought into the inter-marginal section, and its point is stitched to the nasal angle of the latter. The same needle fastens the upper margin of the flap at three points to the ciliary border, a stronger needle the lower margin to the edge of the tarsal tissue. The wound left by removing the skin-flap is stitched (iodoform).

Remarks concerning the first step.—Where the trichiasis is partial only, the inter-marginal section must go beyond the misplaced cilia about 3 or 4 mm. on each side. In the middle portion of the lid, the skin of the lid alone is available (perhaps it would be in all cases preferable). When the trichiasis is a total one, the first visible orifice of a Meibomian gland (?Translator) gives the point for the introduction of the knife, from which it is carried to both sides, the sharp edge of the blade slightly directed towards the tarsal tissue, in order to split the lid.

In the second step shifting of the flap, folding or pressure with the forceps must be avoided as much as possible. In the selection of the skin fine, pale hair must not be overlooked, which may be troublesome at the lower margin and may make it necessary later on (say from 6 to 8 weeks) to remove a piece from the transplanted flaps.

In the third act the operator begins by giving the free margin of the lid and the cilia the proper position (by traction on the skin), in which the assistant is to hold them. If the skin-flap shows the least tension, its basis is undermined until all tension has disappeared. During the application of the sutures the assistant must keep the surface of the flap smooth by stroking it with a small probe or rubber spatula.

It is usually sufficient to keep the eyes three days under

a binocular bandage (bor-lint, rubber-paper, absorbent cotton saturated with boracic acid, and bandage) in order to secure the flap in position and to take out the stitches. A suppuration in the canal of the suture, or a superficial gangrene of a part of the skin are usually of no importance whatever with regard to the result. On the third day we take the bandage off from the healthy eye, on the ninth day from the one that has been operated upon. But we have even seen a healing in the course of forty-eight hours.

The general rules of surgery must guide one with regard to the dimensions of the flap. The height depends on the breadth of the inter-marginal section (about 26 to 30 mm. height of flap), its breadth from the width of the inter-marginal portion and the position of the cilia. With regard to the former we expect a cosmetic, with regard to the latter a therapeutic effect. It is, therefore, better if the flap is a little too broad, which will hardly be perceived in the upper lid and can, if necessary, be easily corrected by an excision.

Right after the operation the cilia are in a correct position. On the next day a new formed substance is found to fill the small space between the wound-surfaces of the two layers of the lid and the inner side of the skin-flap. This new interposed tissue would not allow the margin of the ciliary portion to approach the margin of the tarsal portion, even if the flap should have sloughed (which would be impossible in twenty-four hours). The position of the cilia, therefore, is not dependent on the healing of the flap. After a few weeks this interposed tissue has become a bloodless, firm substance, very much like the tarsal tissue, from which, if the flap should be too broad, wedge-shaped pieces may be removed. This firm substance does not contract any further.

As an operation for trichiasis this method differs from the older operations with so-called transplantation of a flap (1) by the fact that it does not dislocate the cilia, which formerly grew backward, upward or downward, but forces them forward; (2) by not exposing the ciliary border, which the operation is meant to preserve, but a simple piece of skin, to the doubtful risks of a transplantation.

This method, moreover, replaces the inter-marginal portion of the lid, whether this was lost by atrophy in consequence of marginal blepharitis, or in the latter stages of a follicular conjunctivitis. It is a common error which we meet with frequently in literature, that the usual companion of trachomatous trichiasis, viz., entropion, is *primo loco* due to the shrinking of the conjunctiva, while in reality it depends solely, or, at least, in the main on the pressure of the orbicularis muscle. This is the reason why the healing of certain forms of entropion after operations for trichiasis could not be explained. By interposing a substance between the tarsal tissue and the muscle, it is possible to prevent entropion as well as trichiasis.

May the shrinking of the conjunctiva be ever so far progressed, or progressing ever so rapidly, no entropion will be formed, if the muscle cannot act upon the lid-margin. The extent of this action of the muscle may be easily estimated by directing the lids to be forcibly closed after the operation.

Further indications for this operation are given by the symptoms preceding trichiasis and by the chronic inflammations of the ciliary margin, which are more fraught with danger to the eyelashes the more resistance the tarsal tissue opposes to the firmly infiltrated and inflamed tissue.

The following review of Camillo Gallenga's paper on: *Contributions to the study of the infective superficial keratitis* (Journal of the Royal Italian Academy of Medicine, 1887) is translated from *Zehender's klin. Monatsblätter fuer Augenheilkunde*.

We have on a former occasion reported the experiments made by Gifford concerning the micrococci found in the conjunctival sac in cases of phlyctenular conjunctivitis. The result of these experiments was that in the normal conjunctiva very frequently (12 times in 25 cases) pathogenic cocci may be found. They are, however, considerably more numerous in an eczematous conjunctiva. Gifford did not succeed in producing phlyctenulæ in the conjunctiva of rabbits by introducing these micro-organisms into it, and he thought it impossible to take the substance for inoculation in a pure state from the phlyctenular vesicles.

Meanwhile, Burchard in Berlin succeeded in isolating from the contents of the conjunctival phlyctenulæ a very minute micrococcus, which liquifies gelatine slowly, forms colonies of a light yellow color and looks very much like the *micrococcus flavescens desidens* (Fluegge).

Gallenga, the author of the paper under consideration, also studied more closely the contents of conjunctival and corneal phlyctenulæ. He found in them two kinds of micrococci the smaller of which is pathogenic. By wounding the cornea or its epithelium in animals in the slightest manner with these cocci a profuse secretion from the conjunctiva may be started, which however, in itself, is inactive. Yet, twenty-four hours later a small nodular diffuse infiltration is seen to appear on the cornea or the conjunctiva.

This superficial infiltration grows considerably in extent, if the culture has been diluted with sterilized water and been injected under the conjunctiva. Where the cornea or conjunctiva are intact, the micrococci remain inactive.

These experiments were made in order to show the pathogenic property of the micrococci found in the contents of the phlyctenular pustules. However, the different forms of kerato-conjunctivitis are often complicated by peculiar inflammations of the cilia. In the sheath of their roots a great many leucocytes are found mixed with an immense quantity of differently arranged micrococci which are a little larger than the staphylococcus. Although these micrococci are not at all unlike those found on the normal cilia, they are easily distinguished from them.

The author thinks that we have a right to assume that a micrococcus exists in the sheath of the root of diseased cilia, which is larger, but less active than the staphylococcus and which at the same time appears to be able to produce those forms of superficial keratitis which we so frequently meet with in sickly children. The author has taken the material for his investigations exclusively from such children.

The following interesting communication is taken from the *Centralblatt fuer prakt. Augenheilkunde*. *On scotomata accompanying glaucomatous affections of the optic nerve*. By Dr. Theo. Sach.

During the last two years our knowledge of the functional symptoms of the glaucomatous affections has been enlarged by the publications of Bunge and Pflueger. They both concern island-like defects partly in, partly near the centre of a visual field which may be normal or contracted.

Bunge found a paracentral scotoma in four cases out of one hundred visual fields of glaucomatous eyes. He draws two of these as hooked-shaped defects, which encircle the centre of the visual field from above and from in- and downward, reach to the blind spot or come at least very near to it with their lateral end. Of the other two he says that they were similar to those drawn, but that within them the function was not totally abolished.

The scotomata described by Pflueger differ materially from those of Bunge. They were not constant in their existence nor invariable in their form. He calls one of these scotomata "centrally hemianopic," but he states at the same time that it is in no way like the scotomata found in amblyopia from intoxication. Of two further scotomata he simply says that they were paracentral. Of the fourth one he gives no details at all.

On April, 1885, before being acquainted with Bunge's paper, I found the first scotoma in a glaucomatous eye. Since then I paid especial attention to this point, whenever I made a perimetrical examination in similar cases. Thus I found among twenty-seven visual fields of glaucomatous eyes (fifteen of these had glaucoma simplex), five which had scotomata. I acknowledge that it may be a pure accident that I found so many scotomata in such a small series of cases of glaucoma; yet, I am inclined, with Bunge, to think that such scotomata are not so very rare. This, I think, we will find to be so, when we have accustomed ourselves to examine every visual field of a glaucomatous eye especially in this direction.

Aside from the probable frequency of these scotomata, they

are of great practical importance on account of the peculiar form of visual disturbance which they produce, and by the way in which they are affected by the therapeutical agents in glaucoma. Yet they are of still higher interest in considering the theory of the glaucomatous affections of the optic nerve.

Here follow the descriptions of the five cases alluded to. After calling attention to some peculiar symptoms in some of these cases, the author sums up in the following manner :

Considering these circumstances it appears to be absolutely impossible to accuse the increase of the intra-ocular tension of in any way producing these scotomata.

Although agreeing in this with Pflueger I cannot accept for my cases the explanation given by this author for his cases, in which the scotomata were strangely unstable. Pflueger is inclined to explain the scotomata by an affection of the rods and cones of the retina, while the nerve fibres are intact. It is not probable that such an affection of the neuro-epithelial layer, which, according to the extent of the defect, would have to concern an area of the retina of many times the size of the optic disc, and which must according to the intensity of the functional disturbance, cause a very considerable and material alteration, should remain invisible to the ophthalmoscopist. As long as it is, it is merely a hypothesis.

The only and constant anatomical alteration found in the fundus of such eyes affected with scotoma was the excavation of the optic nerve and these peculiar defects of the visual field are undoubtedly due to this excavation, or rather to what in turn produces it.

Jaeger has assumed a peculiar disease of the optic nerve in order to give an anatomical basis for the excavation of the optic disc observed without being due to an increase of the intra-ocular pressure, and Schnabel has proven its existence beyond a doubt (? Translator) by theoretical reasoning and by a series of clinical observations.

We are in general accustomed to see scotomata in cases of disease of the optic nerve. Why then should we be astonished when finding them in eyes affected with a glaucomatous disease of the optic nerve?

Moreover, the scotomata which I observed in glaucomatous eyes show very remarkable analogies especially with the scotomata found in cases of amblyopia from intoxication. The extent of the scotomata above described in a horizontal direction corresponds without an exception with a portion of the scotoma from intoxication, in which, as Bunge and I have elsewhere shown, the conducting elements show the most pronounced anatomical changes. If we succeed in showing that in glaucomatous eyes the site of the intense functional trouble corresponds to the same portion of the visual field, it proves that optic nerve fibres which enter the retina laterally to from 2° to 3° from the macula lutea are most prone to lose their function under the influence of anatomically different affections. The explanation for such a predisposition is, of course, at present wanting.

THE AMERICAN OPHTHALMOLOGICAL SOCIETY.
TWENTY-THIRD ANNUAL MEETING.

[CONCLUDED.]

THURSDAY.—MORNING SESSION.

Case of Glioma of the Retina. By H. D. Noyes, M. D., of New York.

The patient, a child, was first seen when fifteen months old. The eye was enucleated, and microscopical examination confirmed the diagnosis of glioma, which was made prior to operation. The patient was again seen 14½ years later, when 16 years of age. An artificial eye had been worn. There was not the slightest evidence of a return of the disease.

Pseudo-glioma. This case was reported on account of the interest connected with the diagnosis. It was difficult to say positively whether or not there was an intra-ocular tumor. The case was examined by Dr. H. Knapp and the author, and a diagnosis of inflammatory trouble was made. Enucleation was advised on account of the doubt as to the correctness of the diagnosis, and even if the affection were purely inflammatory, enucleation was the wisest plan in view of future possibilities. The patient was a boy, aged five years, who in November, 1886, had fallen from his velocipede, the handle of the machine causing a wound of the left cheek under the orbit. There was no apparent injury to the eye, and during the following winter there was no trouble. On May 4, 1887, he was first seen by the author. There was at this time a cicatrix one inch below the border of the left orbit. No irregularity of the orbital edge could be detected and pressure on the globe caused no pain. The movements of the eye were normal and the pupil active. The iris had a slightly greenish hue. An extremely vascular growth was seen with ease. This appeared

to fill the fundus. After consultation it was deemed advisable to enucleate the eye. This was done, the wound healing promptly. Examination showed that there had been cyclitis with inflammation of the vitreous with the production of a mass of inflammatory tissue extending across the eye behind the lens, forming a perfect septum. The retina was totally detached and the choroid was partially detached. There was also marked hypertrophy of the tissues at the base of the orbit. It was thought that the original process had been an injury to the floor of the orbit.

Prolapse of the Lachrymal Gland. Dr. Noyes also reported the case of C. S., aged 20 years, who consulted him on account of a swelling in the upper lid of the right eye. This had been growing for nine years. It could be freely moved over the globe and moved with the movements of the eyeball. There was no history of injury or of inflammation of the eye. The mass was removed and found to be a displaced lachrymal gland. The removal has been followed by no unpleasant effects. Four cases of displacement of the lachrymal gland are on record.

Operation for the Relief of Entropion of the Lower Eyelid. While in theory the operations for the relief of this condition are very simple, yet in practice they often fail to accomplish the desired end. The author described an expedient which he had employed four years ago. He excised a piece of skin below the border of the lid and then dissected up a flap, leaving an open wound. He next freshened a spot on the outer border of the lower lid, taking out a piece of conjunctiva. He then turned the flap upward and attached it to the freshened surface. This little flap served to hold the lid in a position of eversion. In one week the stitches were removed. The patient then disappeared and was not seen for four years. It was then found that the lid remained in a natural position. The little bridge of skin still was present and under it there was a sinus through which a probe could be passed. The piece of skin was divided and the result was perfect.

DISCUSSION.

Dr. Samuel Theobald, of Baltimore, mentioned in connection with the case of glioma one that had gone nine and one-half years without a return. The only weak point in the case was that no microscopical examination had been made. The macroscopical appearances were, however, characteristic. The operation was done when the boy was 6 years of age. The boy is still perfectly well and there is no suggestion of the return of the disease.

Dr. H. Knapp, of New York, said that until lately he had held the view that there was such a thing as the permanent cure of glioma, but now he was doubtful if this is ever accomplished. There are exceptional cases which do not terminate fatally until ten or fourteen years after operation. They then die from a return of the local disease or else from a generalization of the condition. Graefe says that all of these cases died.

Dr. J. S. Prout, of Brooklyn, had had one case of plastic exudation in the eye of a child which went on to rupture of the eyeball and the death of the patient. He believed that life might have been saved if the eyeball had been removed.

Dr. B. E. Fryer, of Kansas City, had in the diagnosis of small intra-ocular tumors derived in several instances much advantage from the use of the electric light.

Dr. H. Knapp, of New York, in the illumination of these eyes which are blind had used sunlight. The light is admitted through a hole in the shutter and thrown into the eye by a large concave mirror. This is of advantage in the diagnosis of glioma and of sarcoma where the fundus is often very dull.

Dr. Emil Gruening, of New York, had seen two cases in which there had been an apparent immunity from the return of glioma. The first case was operated on in 1875. The patient was a girl, five years of age. The optic nerve was not involved. The girl is still under observation and in perfect health. The second case, a child one year old, was operated on May, 1880. It was a case of true glioma with no involve-

ment of the optic nerve. The child is still perfectly healthy. Both of these patients have been wearing artificial eyes since the operation.

Dr. John Green, of St. Louis, had found most of the operations for entropion of the lower lid unsatisfactory. He had in a general way followed Panas' recommendation of making an incision below and bringing the lid down by the use of sutures. He had extended this operation by the following procedure: After inserting the sutures he makes a cut a little inside of the border of the lid carrying it through the whole thickness of the tarsal fibrous tissue. When this is done the sutures are much more effective and there is no tendency for cicatricial contraction to occur in the process of healing. The results obtained by this method have been eminently more satisfactory than those obtained by any other procedure.

Dr. Emil Gruening, of New York, in the treatment of entropion of the lower lid had employed the method of Hotz, but had passed the sutures through the whole thickness, not only through the orbital tarsal aponeurosis, but also through the conjunctiva. He now has under observation six cases which have been operated on during the past six years and the result has been satisfactory.

A Phenomenal Pulsation of the Interior of the Eye. By Dr. W. F. Mittendorf, of New York.

The patient, 15 years of age, came under observation for asthenopic trouble. He showed no signs of disease. The tension of the eye was normal and the fundus was normal. There was no pulsation of the arteries or veins, but pulsation could be induced by pressure. A short distance above the disk there was a grayish-white band stretching from one vein to another and looking like a little sac filled with fluid. In the middle this band presented a little point. This band further showed distinct pulsation which corresponded with the cardiac pulsation. The patient was seen a number of times and the appearance was always the same. A little higher up and more to the nasal side, there was a similar band connected with

an artery. This did not pulsate except when pressure was made. It was thought that the band was composed of connective tissue which was thrown into vibration by the meeting of the vibration of the two veins with which it was connected.

DISCUSSION.

Dr. Edward Jackson, of Philadelphia, recently saw in a case that presented no spontaneous pulsation a little band extending from the peri-vascular sheath which was thrown into vibration with each radial pulsation. This condition occurred in both eyes.

Increase of Blindness in the United States. By Lucien Howe, M. D., Buffalo.

Attention was called to the fact, that while the population during the ten years from 1870 to 1880 increased at the rate of 30 per cent., blindness during the same time increased over 140 per cent. By means of a diagram this percentage of increase in each state separately was shown. The statistics also show that blindness increased in an almost constant ratio from North to South in the United States, and that it decreased in the same way from East to West. This was also shown by colored maps. The cost of sustaining this army of over fifty thousand blind was estimated on the lowest basis of cost, and of wages which would have been earned, at over sixteen million dollars in 1880, or over twenty-five million in 1887. As for the causes, contagion was found to exercise the most important influence. This was found by a special examination made for the purpose of 128 pupils at the Batavia asylum for the blind, by the statistics collected by Magnus and by the record of over forty-eight thousand cases treated at the Manhattan Eye and Ear Hospital. Immigration was also considered as an important factor in view of the large number of contagious diseases of the eye introduced every year into the country, and the laxity or absence of quarantine regulations regarding them. As for the prevention, suggestions were

offered, first, as to the care of new-born children; second, the isolation of suspicious cases in residential schools and other institutions, even for adults also; third, the instruction of the public as to the advisability of guarding against contagious forms of disease.

Finally, it was advised that the entire matter be referred to a committee to examine again the statistics and report more complete methods for the prevention of blindness.

DISCUSSION.

Dr. Swan M. Burnett, of Washington, had been much interested in the statistics of Dr. Howe, particularly in those with reference to the greater percentage of blindness in the Southern portions of the United States as compared with the middle and more Northern portions. This brings up the important question of the influence of race. The larger part of the population of the South is, of course, negroes, and the larger part of the blindness must be among that race. It had been his experience that negroes do not suffer to any degree from trachoma. In a study of several thousand cases of eye troubles among the negro, he had found only one genuine case of trachoma and that occurred in a mulatto. The conjunctival diseases which in other races cause a large part of the blindness must be thrown out in considering the negro. The negro, however, suffers much more from scrofulous disease of the eye, particularly of the cornea than do the white race. Negroes also suffer largely from ophthalmia neonatorum and many cases of blindness due to that cause have come under observation.

Dr. Mittendorf, of New York, was not surprised to hear that blindness in the United States is increasing. He thought that the most prolific cause of this is the over-crowding of young persons in institutions. An examination of a large institution in the neighborhood of New York has shown a large number of contagious ophthalmic cases in that institution, not known or neglected. In our large dispensaries we meet almost

weekly with persons who have become blind from neglect and from contracting diseases of this kind in such institutions. It is very difficult to get an idea of the exact number of blind persons. The great majority of blind children are not counted in these statistics. They are kept at home and provided for there. One of the most important things is to stamp out these diseases in large institutions, and the best way to do this is to prevent overcrowding. Instead of placing the children in large buildings, they should be sent to the country and placed in small numbers in cottages.

Dr. Peter A. Callan, of New York, said that the whole question turns on this, what can we do? We are very backward in that respect. In London they have a society for the Prevention of Blindness, which does good work. The spread of the disease is often due to neglect and often to the use of improper applications in ophthalmia neonatorum by the mother or the nurse. Ought we not in every state to organize societies and instruct the people what they should do and what they should not do?

Dr. Myles Standish, of Boston, had found that the most troublesome cases of trachoma and the like occur in persons who have been in the country only two or three weeks. When they arrive in the country the disease is usually at its height and they are in a condition to spread the affection among those with whom they come in contact.

In connection with this matter, Dr. Howe offered the following resolutions:

WHEREAS, The census reports indicate that there has been an increase in the number of blind in the United States, more than four times as great as that of the total population and

WHEREAS, An inquiry as to the causes of this, shows that it is largely due to contagious diseases of the eye, therefore

Resolved, That a committee of three be appointed to examine further as to this apparent increase, and recommend means for its prevention.

Resolved, That the President of the United States and the Secretary of State be respectfully requested to furnish this

committee with whatever letters or other recommendations may be necessary to further their investigations in this country or elsewhere.

Resolved, That the official in charge of residential schools and similar institutions also be requested to assist the committee to any extent in their power.

These resolutions were adopted and the President announced Dr. Lucien Howe, of Buffalo, as Chairman of the committee. The other members to be appointed subsequently.

The Eye of the Adult Imbecile. By Charles A. Oliver, M. D., Philadelphia.

Twenty young adult male imbeciles were examined, care being taken to exclude all but the proper class of subjects. Nineteen observations were obtained from which were drawn the following conclusions:

1. The eye of the male adult imbecile is an organ which is capable of proper functional activity.

2. By reason of early mental incapacity, the ordinary appearances seen in the used eyes of the mentally healthy are lessened in due proportion to the amount of work given to the organ.

3. The eye of the imbecile, being practically an unused organ for close and careful near work, the distention of the globe and the elongation in its visual axis with consequent increase in index of refraction is almost entirely avoided; this being in direct ratio to use.

4. The want of these physical changes may be considered as significant of a type of unused healthy adult human eyes.

5. The healthy eye of the imbecile serves to teach us that the various conditions seen in the used eye of the mentally healthy must be considered as pathological changes, the representatives not only of general want of tone but of constant and frequent abuse of a delicate organ.

Dr. Charles A. Oliver also exhibited water color sketches of a case of double chorio-retinitis with partial degeneration of the optic nerve, associated with curious lymph extravasation

into the retina and vitreous in a boy 12 years of age who had had an attack of basilar meningitis five years previously, at which time the eyesight became bad. No hereditary dyscrasia could be discovered. Vision was greatly reduced and patellar tendon-reflex was almost abolished.

Additional Cases of Hypertropic Refraction, Passing While Under Observation into Myopia. By S. D. Risley, M. D., Philadelphia.

Thirteen carefully studied cases in which the eyes with hypermetropic refraction had been observed to pass into myopia had been recorded in the annals of the society. To-day the author brought forward nine additional cases, making a total of twenty-two. In all these cases the state of the refraction had been repeatedly demonstrated under complete paralysis of the accommodation. In every case there was well-marked retino-choroidal irritation with asthenopia. Insufficiency of the internal rectus was noted in three cases, in all of which tenotomy of the external rectus was performed. In no case was emmetropic refraction observed at any stage of the progress. The condition seemed to pass from the shallow hypermetropic ball to the lengthened myopic eye by the turn stile of astigmatism. A detailed record of nine cases was given.

The most important measure in the treatment of these cases was considered to be the use of correcting glasses. When we consider the large number of cases which at the first present the same condition as the cases reported and who have subsequently had no return of the trouble, we cannot but think that the group of cases now presented are only those in which the treatment has failed, and that without their correcting glasses a much larger number would have pursued the same history. A study of these cases has demonstrated to the author the importance of astigmatism when present in very low degree, as a factor in setting up these changes in the nutrition of the eyeball, which result in impaired resistance to even normal intra-ocular tension.

The Pathogenesis of Pterygium. By Samuel Theobald, M. D., of Baltimore. (See page 207, this number.)

The generally accepted theory of Arlt that pterygium has its origin in a marginal corneal ulcer to which a tag of conjunctiva has become attached he thought was untenable, because if this were its usual mode of origin, pterygium would be found approaching the cornea from every possible direction, since marginal corneal ulcers are not apparently more frequent in one position than in another. It is known, however, that such is not the case, but that pterygium is almost always situated directly over the recti muscles, and that in a very large proportion of cases it is over the rectus internus. The more recently proposed theory of Poncet, that pterygium is due to the presence of microbes which tunnel their way under the corneal epithelium is open to the same objection, for this also assumes the existence of a precedent corneal ulcer. The view long held that conditions which tend to induce chronic hyperæmia of the conjunctiva favor the formation of pterygium he thought as well established.

Assuming that this view is correct, are there reasons why a localized hyperæmia of the conjunctiva should be of frequent occurrence where pterygium usually forms, to the nasal side of the cornea. This was answered affirmatively. The close connection between the vessels of the recti muscles and those of the anterior portion of the conjunctiva were referred to, and it was pointed out that the determination of blood to these muscles might influence the blood supply of the overlying conjunctiva and that this would be the case especially with the recti interni since they were the largest of the straight muscles and in close relationship with the conjunctiva because attached to the sclerotic nearer to the corneal border than any of the others. Abnormality in the distribution of the blood supply of the internal recti muscles and of the overlying conjunctiva, and more frequently still disturbance in the normal relationship between convergence and accommodation such as insufficiency of the internal recti muscles the different vari-

eties of ametropia. These were regarded as the usual causes of pterygium through the localized hyperæmia of the conjunctiva to which they gave rise.

Recurrent Retinal Hæmorrhages Followed by the Outgrowth of Numerous Small Blood-vessels from the Optic Disc. By Samuel Theobald, M. D., Baltimore.

The case reported was that of a lady, 52 years of age, in whom menstruation had recently ceased. During a period of nine months she had suffered with recurrent hæmorrhages into the retina and the posterior part of the vitreous humor of one eye. The macula escaped serious involvement and central vision was but little affected. The hæmorrhages were supposed to be due to thrombosis of one of the larger retinal veins. Finally, a nebulous outgrowth from the optic disc extending forward into the vitreous humor for some distance made its appearance. This consisted of numerous small and nearly parallel blood-vessels running from behind forwards and held together by semi-opaque tissue, the outline of which could be easily distinguished from the surrounding vitreous. When last seen this growth had diminished somewhat in size. The prognosis was regarded as favorable, the development of new vessels being looked upon as an effort of nature to repair the damage caused by the repeated hæmorrhages.

DISCUSSION.

Dr. W. H. Carmalt, New Haven, reported the following case: On February 17, 1877, a gentleman presented himself complaining of sudden blindness in the left eye. This was filled with blood which prevented a thorough examination. A month later examination showed nothing peculiar, except traces of coagula in the vitreous. August 3 of the same year he began to complain of affection of the other eye. On this occasion Dr. Noyes examined the eye and found hæmorrhage into the vitreous of the right eye. The condition cleared up in that eye, and on June 3, 1878, the left eye was again affected. These attacks have continued to recur every few months.

Dr. B. E. Fryer, Kansas City, asked with reference to the cases of recurrent hæmorrhages, whether or not attention had been directed to scurvy as a cause? He had seen one case of recurrent retinal hæmorrhage which he thought was due largely to that cause.

Dr. O. F. Wadsworth, of Boston, had seen several cases of recurrent hæmorrhage partly retinal, but largely into the vitreous. In only one could he positively say that there was a development of vessels into the vitreous. The other cases have not been observed sufficiently long to show whether or not there has been a development of vessels. The case referred to was that of a man seen ten years ago, when he was thirty-five years of age. There was extensive hæmorrhage into the vitreous of one eye, rendering the fundus invisible. This cleared up to a certain extent, leaving portions of the retina clear. Then certain changes in vessels toward the periphery could be seen. The other eye showed a perfectly healthy fundus, except in certain places toward the equator, where there were several patches of perivasculitis. The hæmorrhages continued to recur in the affected eye. After a time there could be detected in the vitreous a nearly transparent membrane containing vessels, some of which could be traced back to the retinal vessels. Two or three years later he again saw the patient. He had then been free from recurrences for a year or two. There were still some vessels in the vitreous, but not so many as previously.

Dr. H. Knapp, of New York, said that in the treatment of this condition the main point is not to fatigue the eyes and to put them at rest early in the evening. A waitress in a New York family suffered from hæmorrhage every time the family gave an evening party. She was sent to the country and the hæmorrhage cleared up. She returned and served at an evening party, and again the eye filled with blood. She has now given up service and for two or three months has had no trouble. The treatment consists in rest, and in avoidance of everything that would produce a dropsical condition of the blood.

Embolus of the Central Retinal Artery. By G. C. Harlan, M. D., Philadelphia.

The patient was a clerk, 52 years of age, in good general health. While reading in perfect comfort, a shadow suddenly appeared before the left eye, and on closing the other he could just distinguish large objects about the room, "through a brownish haze," and in a few minutes sight was entirely gone.

An ophthalmoscopic examination made the next morning showed an extensive œdema of the retina giving the whole fundus a grayish tinge; disc pale and its margin blurred; arteries very pale, although not much narrowed, and some of the smaller branches lost in the retinal œdema; larger veins contracted in places particularly in and near the disc, but generally of full calibre; phenomenon of visible, slow, continuous circulation of blood in bead-like sections well marked in superior temporal artery and vein; macula occupied by bright red patch, oval in form with its long diameter horizontal, and several minute terminal vessels in its neighborhood enlarged and apparently isolated; two small dots of retinal hæmorrhage at outer margin of disc. The œdema increased decidedly for the first few days and then gradually subsided. There was still a little remaining on the 19th day, after which the patient was not seen for three weeks, when the color of the fundus was normal. The visible circulation lasted only about a day and a half, disappearing first in the artery. The veins refilled at their narrowed portions and retained nearly their full calibre, while the arteries became paler and narrower until only the two main trunks could be seen, and these showed white lines along their margins from perivasculitis. The spot at the macula gradually disappeared. The disc regained the distinctness of its outlines, but remained dead white. Colored plates were shown illustrating the first and the final appearance of the fundus.

The pathology of the case was very obscure. The heart and kidneys were normal, and there was no symptom of degeneration of the arteries. A caries of the middle turbinated bone on the same side, from long standing nasal catarrh, was

not thought more likely to act as a cause than would be a similar local disease in any other part of the body.

The only possible causes seemed to be: that some product of the nasal disease might have found its way into the general circulation and lodged in the retinal artery; that an embolus might have been formed of a fragment washed from a parietal thrombus in some distant vessel; or that the obstruction might have resulted from disease in the retinal artery itself.

Chronic Glaucoma. Dr. David Coggin, of Salem, Mass., read a paper on this subject describing a case, the object being to elicit discussion as to the best method of treatment.

Danger to Iron Workers from the Use of Old Hammers. By Dr. George C. Harlan, of Philadelphia.

A hammer was shown from which a fragment had split off, injuring the eye of a workman. The constant concussion of the hammer causes it to assume a crystalline condition and become very brittle.

A Case of Retinitis Pigmentosa Treated Electrically. By Myles Standish, M. D., Boston.

The patient was a woman, 33 years of age, and was myopic 1.50 D. She had worn glasses since she was 17 years of age. When first seen, April 14, 1886, her sight had been failing for three years and for the last three months had failed very rapidly so that she could not go on the street alone after dark. Upon ophthalmoscopic examination characteristic patches of retinitis pigmentosa were found in the periphery of the fundus of each eye.

Her vision was right eye $\frac{12}{40}$; left eye $\frac{12}{40}$, and the fields of vision were limited to less than 20° in the vertical and horizontal axes.

The only treatment has been the use of the constant current, of such strength as could be easily borne. This has been applied once in five days during the last fifteen months. Her present vision is right, $\frac{12}{40}$; left eye $\frac{12}{40}$, and the fields of

vision have now vertical and horizontal axes of 70° . She now goes on the streets after dark with safety.

Aseptic Cataract Extraction with Irrigation. By C. H. Williams.

The author reported five cases of irrigation of the anterior chamber after cataract extraction with a $\frac{1}{2}\%$ of chloride of sodium as recommended by Dr. McKeown. Instead of a syringe, a glass flask was used, bearing two glass tubes blown in the side. One of these was drawn out to a fine nozzle that could be easily inserted into the anterior chamber; the other had a rubber tube and mouth-piece attached so that the pressure of the stream could be controlled by the operator. The flask had a capacity of 50 cc., more than enough to complete any irrigation without removing the tube from the eye. The irrigating instruments and the 2% solution of cocaine were sterilized in the steam sterilizer and this was not found to injure the anæsthetic properties of the cocaine. The rest of the instruments and the dressings were sterilized by dry heat at a temperature of 50° Cels. In order to determine the efficiency of the solution of the biniodide of mercury used for the preliminary washing out of the conjunctival sac, some experiments with plate cultures were made at the laboratory of the Harvard Medical School, through the kindness of Dr. Ernst. An equal amount of the biniodide of mercury and the iodide of potassium were dissolved in water and added to 10% nutrient gelatine, to give a series of strengths up to 1 to 5,000 of the biniodide to the gelatine. Ten days after exposure to the air of the laboratory for six and one-half hours, no growths of bacteria were found among the plates, although on the unprotected plates exposed at the same time, there was an abundant development of colonies of bacteria. Gelatine of the strength of Panas' solution (1-20,000) was then tried, and these plates after four days showed an average of 1.5 and 0.8 colonies of bacteria to the square centimetre of surface in the two series of plates, while on the unprotected plates the average was 10.5. In two of the cases of extraction a suture was passed

through the piece of conjunctiva above, and this held the wound well in apposition. All of the extractions were done without iridectomy, and a layer of iodoform was dusted on the edge of the closed lids, just before applying the bandage.

Case of Congenital Zonular Greyish-white Opacity Around the Fovea. By O. F. Wadsworth, M. D., Boston.

The patient was a child, eleven months of age. She was unable to sit or stand, and could not hold anything in her hands. She appeared to take little notice of anything. Externally the eyes were normal. With the ophthalmoscope the discs did not seem to vary from the normal appearance. The macula was dark red and surrounded by a grayish-white opacity. The remainder of the fundus appeared to be normal. There appeared to be some light perception. Five months later there seemed to be no perception of light. The disc was sharply defined, the central vessel small. The mother had had four healthy children. The fifth, according to the history, had been sick in a similar way as the one under consideration. In all the reported cases some weakness of the general muscles was noted.

Separation of the Retina in Both Eyes with Albuminuria of Pregnancy—Replacement. By O. F. Wadsworth, M. D., Boston.

The patient was a married woman seven and one-half months pregnant. About the beginning of the eighth month œdema of the eyelid appeared. This was soon followed by indistinctness of vision. The urine was loaded with albumen and contained hyaline and granular casts. When seen by the speaker, there was a general separation of the retina in the right eye. In the left there was also separation of the retina, but not so distinct. After consultation, it was decided to induce premature labor. This was done, and a living child was delivered. Before the completion of labor a convulsion occurred for which bleeding was resorted to. The patient convalesced and vision gradually returned. When last seen, the

disks were clearer. No separation could be made out in either eye.

Dr. B. Alexander Randall, of Philadelphia, read a paper describing a *Case of Coloboma of the Optic Nerve*.

Dr. F. Butler, of Montreal, Canada, read a paper describing *A Peculiar Form of Granular Conjunctivitis Associated with Ichthyosis*.

Two cases in which this combination was present were reported.

Adjourned.

AFTERNOON SESSION.

Dr. W. S. Dennet, of New York, exhibited an ophthalmoscope in which the lamp was substituted by an electric light behind the mirror.

Dr. Lucien Howe, of Buffalo, presented a small pocket ophthalmoscope with movable disc.

Dr. Howe also exhibited several photographs of the Interior of the Human Eye.

Dr. Edward Jackson, of Philadelphia, presented a Set of Small Test Lenses, with a Modified Trial Frame.

The lenses are one inch in diameter, and the saving in weight is from one-third to three-fourths of the weight of those in common use. The lenses are plano-convex and concave, giving advantages on the double convex and concave, by lessening spherical aberration, being easier to combine together, and making it possible to neutralize more perfectly spectacle glasses the strength of which it is desired to test. Several lenses had been added, to the series usually placed in such sets; including stronger concave sphericals; and two astigmatic lenses, which had been found very convenient in testing for astigmatism. It was suggested that all intermediate lenses added to the metric series, should be made to divide in half the present intervals of one-fourth dioptre; making the interval one-eighth and preserving the simplicity of the system.

Making the lenses smaller allows the trial frame to be made smaller, and very much lighter; so that the new frame with the new lenses weighs less than half the old frames with lenses of equal strength. The temple of the frame is attached to the lower part of the lens holder, allowing the lenses to be placed in the back groove of the holder or withdrawn therefrom through the natural depression of the temple instead of across the prominence of the brow or cheek. The set and frames are made by Queen & Co., of Philadelphia.

Dr. S. D. Risley, of Philadelphia, described an Ophthalmoscope with Cylindrical Lens.

The ophthalmoscope is of the usual form, but behind the mirror there are two slides containing the cylindrical glasses. In one slide the cylinders are $+ .50$, 1.00 , 1.50 , 2.00 , 2.50 ; in the other $+ .25$, $.30$, 4.00 , 5.00 and 6.00 . With these numbers any desired combination can be made. The axes of the cylinders are rotated by rotating the instrument as a whole. The instrument is especially useful at the bedside for the purpose of correcting a high degree of astigmatism when present.

A Modification of the Refraction Ophthalmoscope with an Attachment for Using Cylindrical Glasses. By Swan M. Burnett, M. D., of Washington, D. C.

The modifications of the ophthalmoscope which were offered by the speaker consisted, first, in a clip behind the instrument into which the cylinders in the test case can be inserted. The inclination of the axis is read on a graduation on the back of the mirror. The author had found this arrangement satisfactory in verifying the diagnosis of astigmatism made by other methods and for examining the fundus of the astigmatic eye free from its anomalous refraction. Secondly, two supersposed discs containing lenses which singly and by combination give 47 numbers (22 plus and 25 minus lenses) with a regular interval of 0.5 D up to 10.5 plus and minus. Thirdly, a plane circular mirror with a concave tilting mirror swung in front of it. The

plane mirror does not interfere with the tilting mirror when in use and when it is desired to use the plane mirror alone the tilting mirror can be detached from its upper bearing and swung downwards out of the way on its lower bearing. The instrument is very light. It is made by Queen & Co., of Philadelphia, and its cost is about \$20.00.

Transient Myopia Following Iritis. By John Green, M. D., St. Louis.

In 1867 the speaker had been the subject of iritis involving both eyes. During convalescence he noticed that the dimness of vision was not wholly due to lack of transparency of the media and that vision was improved by the use of concave glasses. He had occasionally observed in other patients with iritis that as they recovered their vision was benefited by the use of concave glasses. Last April the speaker had iritis affecting the left eye. He was then able to compare the one eye with the other, and found that the myopia induced by the iritis amounted to 1.50 D. This gradually diminished until it disappeared at the end of four weeks, leaving the normal refraction. He had been unable to find accounts of myopia as a transient symptom during convalescence from iritis.

DISCUSSION.

Dr. O. F. Wadsworth, Boston, confirmed Dr. Green's observation with reference to the occurrence of myopia during the convalescence from iritis. Patients who have had no myopia before are benefited by concave glasses. This has gradually grown weaker. He had seen this repeatedly, but it does not occur in every case.

Dr. G. C. Harlan, of Philadelphia, reported an interesting case recently under his care.

A young man, myopic $2\frac{1}{2}$ D., came under observation several months ago with the history that he had spots coming before the right eye and that there had been a sudden decrease of vision. He found a certain amount of choroidal irritation

and a posterior polar opacity. This began as a six-armed cross with rectangular arms. These became more diffused during the following six weeks. During this time there had occurred a marked opacity in the anterior portion of the lens, without traumatism and with only a moderate degree of choroidal inflammation. There was no special increase in the myopia so far as the author was able to determine.

EXECUTIVE SESSION.

The report of the Committee on Congress of American Physicians and Surgeons was received and the following resolution adopted:

Resolved, That the American Ophthalmological Society appoint a representative, and alternate, to the proposed executive committee of arrangements for the Congress of special societies, with the proviso that in making the appointment this society does not commit itself to an approval of the present sketch in all its details.

Dr. Wm. F. Norris, of Philadelphia, was elected representative to the Executive Committee of the Congress and Dr. D. B. St. John Roosa, New York, was elected alternate.

The Nominating Committee reported as follows:

Officers for ensuing year:

President—Dr. Wm. F. Norris, of Philadelphia.

Vice-President—Dr. Hasket Derby, of Boston.

Secretary-Treasurer—Dr. O. F. Wadsworth, Boston.

Corresponding Secretary—Dr. J. S. Prout, of Brooklyn.

The following were elected to membership:

Dr. Geo. Cutter, of Brooklyn.

Dr. D. C. Cocks, of New York.

Dr. H. S. Oppenheimer, New York.

Dr. Charles McIlvaine, of Trenton.

Dr. David DeBeck, of Cincinnati.

The next meeting of the association will be held at New London, Conn., on the third Wednesday of July, 1888.

CORRECTION.

The name of the author of the paper on "Photographing the Interior of the Human Eyeball," published in our last number is not, as printed, Dr. E. Barr, but Dr. Elmer Starr.

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No. 9.

HEMERALOPIA WITHOUT APPRECIABLE LESION.

BY THOMAS FEATHERSTONHAUGH, M.D., ALBANY, N. Y.

Hemeralopia in association with pigmentary retinitis, of which disease indeed it is the chief subjective symptom, is sufficiently common to every ophthalmic surgeon to pass without comment. Idiopathic hemeralopia, as it has been called, "in which there are no certain ophthalmoscopic alterations, and for which no certain causes can be found"—*Arch. Oph.*, xii, 191—is, on the contrary, sufficiently rare to make a marked case worthy of record.

In addition to its recurrence in pigmentary retinitis, hemeralopia has been observed in connection with various affections of the liver, and in attacks of scurvy. Hemeralopia, too, without appreciable lesion, or with unusual etiological factors, has been noted by various observers. I append a few of the cases that our literature offers, as having an illustrative bearing upon my topic:

Sedan—*Rec. d'oph.*, Nov., 1885—reports a case of hemeralopia in which there was no disturbance of the color sense, no pigmentary retinitis, and no limitation of the visual field.

Dr. Bader, in *Oph. Hosp. Reports*, 1859, describes a case of

hemeralopia in which the only thing to observe was that "the fundus round the optic nerve entrance had a bluish-red tint, as if the choroidal red were seen through a faintly blue-tinted glass.

Prof. Dr. H. Dor, in the *Archives d'Ophthalmologie*, III, 482, gives the details of a case of hemeralopia occurring in the person of a young man 21 years of age. The only lesion observable here was a greyish-white reflex from the fundus instead of the usual red. This whitish reflex extended from the disc in every direction almost to the equator, at which place the ordinary reddish color was apparent.

M. Chibret—*Arch. d'Oph.*, IV, 79—reports congenital hemeralopia in connection with myopia in which the only notable lesions were physiological excavation of the papilla of each eye, and a posterior staphyloma in each.

Without further preface I will give the salient points of a case of absolute hemeralopia which I have had under my observation for about four years. I may say here that the subject of this sketch is not only my patient, but also a valued personal friend. My opportunities therefore for observing, in his person, the characteristic phenomena of hemeralopia have been unusually good.

Mr. G., about 21 years of age, a young man of unusually fine physique and remarkably robust, has, from his earliest recollection, been totally blind in the ordinary darkness of night. If in the country, and consequently away from the street lights of the city, he is utterly helpless if left alone after dark. He says he can see nothing after dark comes on, unless aided by artificial light. In the city where he lives, which is well lighted with electric lamps, he is constantly running into people in the evening, striking himself against trees, etc., and has often hurt himself by these accidents. By daylight he thinks that he sees very well, as well, in fact, as any of his associates. He has suffered from *blepharitis marginalis* for several years, and has been subject to severe headaches. During his younger years he was a somnambulist. I have often seen him, before going to bed, arrange a trap of chairs to prevent himself from wandering out of his room in the event of getting up during

sleep. The action of his heart is irregular, but no lesion of this organ can be detected on repeated and careful auscultation. He has always been deaf; he cannot hear my watch,—the ticking of which can be heard by the average ear at a distance of ten feet,—when it is placed tightly against the ear. The *Mm. tympani* appear normal with the exception perhaps of a slight retraction.

V. R= $\frac{20}{x_1}$ with sph. $-0.75 \bigcirc$ cyl. $-1.25, 20^\circ$.

V. R= $\frac{20}{y_1}$ with sph. $-2.00 \bigcirc$ cyl. $-0.75, 160^\circ$.

The results were obtained after repeated tests and with atropine mydriasis. Graefe's test shows a slight insufficiency of the *recti interni*. Color sense normal in a good light. Bitot's conjunctival plaques are not present. Perimetric measurements show the field in each eye perfect. I have not made the experiment of testing the fields under diminished illumination, though I am sure that the perimeter would indicate hemeralopia very distinctly, were such a trial made. The record of visual power as given above, was made under the best illumination possible in the consulting room. With diminished light the vision fails proportionally. Mr. G. can see stars of the first magnitude and some of the brighter planets, if the atmospheric conditions are favorable, but I do not believe that he has ever seen a star of the second or third magnitude. No other member of this family, so far as I am able to ascertain, has suffered from hemeralopia.

When I examined the eyes of my young friend with the ophthalmoscope for the first time I was unaware of the hemeralopia, and recorded the note in the case-book that nothing unusual about the fundus was to be seen. Since then I have repeatedly made careful examinations and I have noted that the reflex is much darker than is common. The intervacular spaces have faint brownish stripings radiating out from the disc. The papilla is perfectly normal, and no contraction of the retinal arteries can be demonstrated. It must be remembered that my patient has dark hair and a dark skin, and that the abnormal appearances, if they are abnormal, are no more

striking than those which we habitually pass by without notice.

I regard the case as one of more import than simple retinal anæsthesia or "pigmentary retinitis without pigment" as it has been called. That there is some central defect in the general innervation, I think is evidenced by the neurotic symptoms, some of which have been mentioned above. The deafness without visible lesion seems to me to be exactly parallel in its etiology with the blindness. Mr. G. has simply a lack of sensitiveness in these organs that prevents him from receiving the delicate impressions which are ordinarily perceived by others. I have made no experiments in regard to the other senses, but I have no doubt that, could delicate tests of the taste and smell be made, we would find these senses, too, below the average of acuteness.

My prognosis is favorable. Dr. Noyes in his recent work says: "Hemeralopia without pigmentation is less prone to increased loss of sight and more frequently comes to a stand" than hemeralopia dependent on pigmentary retinitis.

I have prescribed the proper glasses. The blepharitis and headaches, by their use, have disappeared; but after three years of pretty constant use of the glasses there have been neither improvement in the visual power nor apparent diminution of the principal subjective symptom, the hemeralopia.

INTERNATIONAL MEDICAL CONGRESS.¹

SECTION OF OPHTHALMOLOGY.

DR. J. J. CHISOLM, OF BALTIMORE, MD., PRESIDENT.

Secretaries.—Drs. A. Alt, of St. Louis, Mo.; J. A. White, of Richmond, Va., and R. L. Randolph, of Baltimore, Md.

MONDAY, SEPTEMBER 5TH—FIRST DAY—AFTERNOON SESSION.

The President, on taking the chair, expressed his high appreciation of the honor conferred upon him, and referred in feeling terms to the regret felt at the absence of Dr. E. Williams, of Cincinnati, the unanimous choice for the position. He referred to Dr. Williams as the pioneer in ophthalmology, the first of the specialties to branch out as a separate department of medical science, and the difficulties he had met with when devoting himself to diseases of the eye and ear exclusively. To-day it is acknowledged that progress in general medicine is attained only through studies and researches in special departments, and every organ has its investigator. The assembly of this International Medical Congress is, to a large extent, an assembly of eminent specialists from great distances, at personal expense, to interchange their thoughts and conclusions upon various subjects. He referred to the vastness of the subject of the human eye alone, and that there is no disease of the eye so thoroughly mastered that further information is not desired. Operations are still far from perfect, and the origin and nature of glaucoma, for instance, is not clearly defined.

The microbic element in eye affections was also mentioned, and the intimate relation of eye diseases to distant reflexes.

In concluding, he repeated his welcome to the members of

¹This report of the Section of Ophthalmology we owe to the courtesy of Messrs. W. Wood & Co., the publishers of the *N. Y. Medical Record*, to whom we herewith give our thanks.

the Section as friends and co-workers in the department of ophthalmology.

The first paper of the session was on

EYE TROUBLES IN THEIR RELATION TO OCCIPITAL DISEASE,

by Dr. A. Mooren, of Düsseldorf, Germany.

Dr. Mooren introduced his subject by a recital of the initial observations of Huguenin and the experimental researches of Munk, who removed the visual spheres in the occipital lobe of the dog, and found that it rendered the animal blind, but left intact all the functions and movements not dependent on vision. Then, after referring to the clinical observations of Hirschberg, Pooley, Pflüger, Hughlings-Jackson, Gowers and others, he entered into an analysis of 42 different cases of his own, in which hemianopsia was present, 14 of which were on the right side, 19 on the left side, 4 temporal and 5 nasal restriction. The causes were various.

He found that hemianopsia dependent upon occipital lobe disease is not complicated with mydriasis or capillary apoplexies on the insertion of the optic nerve. It is the merit of Willbrand to have collected the different observations made on this sense. He formulates as follows :

The color-sense is to be placed on the most exterior cortex of the occipital lobe; beneath this another layer, the centre for acuteness of vision. In a third layer beneath this again there exists, next to Gratiolet's visual radiations, the light-centre, *i. e.*, the centre for visual field. Destruction of the upper or color-perception layer may take place without affecting the underlying layers, as is demonstrated by the observations of Bjer-num and Samelsohn, and Dr. Mooren's observations of the loss of color perception in his cases without necessary impairment of vision are in accordance with those of previous observers.

He referred to the determination by Nothnagel of the occipital limits of pathological changes, by means of the method of the smaller focus. After the observations of Haab, Hu-

guenin, Feré and Seguin, this neurologist places the centre of optic perception in the cortex of the cuneus and first occipital convolution. This is confirmed by sections made by Curschmann.

Dr. Gradle, of Chicago, mentioned a case which appeared to him to have a bearing on the subject under discussion. A child, during an attack of what was supposed to be scarlet fever, had pain in the back of the head, which was drawn backward. Some time afterward, when seen by the narrator, it appeared to be blind, but the pupils were both quite active to light. Treatment by potassium iodide appeared to produce a beneficial result, and when last seen vision seemed to be completely restored.

Dr. Dickinson, of St. Louis, asked if Professor Mooren adopts the theory of total or partial decussation of the optic nerve fibers, to which Mooren replied by a diagram, showing the distribution of fibers from the right side to the outer half of the right retina and the inner or nasal half of the left, and so with the other side.

Dr. Marmion, of Washington, reported the case of a lady who had gradually developed impairment of perception, followed by diplopia. A suspicion of specific infection induced him to prescribe mercury and the iodides. Ataxic phenomena came on, and she finally expired. Autopsy revealed a large gumma of the right inferior lobe of the cerebellum.

Dr. Behrmann, of Washington, reported a case of blindness produced by caffein, which acted by continued anæmia of the occipital lobes of the cerebrum, finally ending in atrophy.

The President presented in this connection a case of blindness with occipital disease. Some years ago pain began to be felt behind the left ear, shortly followed by swelling in the same region. The swelling gradually increased, and now a softish tumor of considerable size can be seen and felt, over which the bone has been absorbed. In the later period of its growth the hearing in the left ear became dull, and the right eye became blind. He could still read with the left eye. At that time both optic nerves appeared white and atrophic, one

not more than the other. The pain has now almost disappeared, but he has only perception of light in the left eye.

Dr. Ole Bull, of Christiana, Norway, read a paper entitled :

PATHOLOGICAL CHANGES IN THE RETINAL VESSELS.

He had seen eighteen cases of disease of the retinal vessels in six thousand five hundred cases of eye disease. In some there were emboli, in others what appeared to be constriction or narrowing of the retinal vessels. He noted in some of the cases occasional spasmodic constriction of the arteries, with resulting anæmia and loss of vision, with some recoveries of vision, as distinguished from true emboli. Thrombus and gumma were referred to as causes of pathological changes in the vessels, in some cases distention, in others constriction, resulting. In all cases of organic change, serious impairment of vision or total blindness resulted.

Dr. P. D. Keyser, of Philadelphia, questioned as to whether in many of the cases it was a true embolism or a contraction of the arteries. A case which came to him blind from what appeared to be embolism, recovered good central vision, but had a field only two inches square. The treatment was galvanism. He had questioned whether, if the treatment had been commenced earlier, the vision and field might not have been entirely restored.

Dr. A. Heyl, of Philadelphia, questioned as to whether it was embolism or a loss of blood tension, as in a case of blindness after post-partum hæmorrhage, where the blood-amount is much lessened and tension much diminished. He also believed that one element in the blood-tension is the contractile force of the endothelium of the blood-vessel. When the tension is diminished this force comes into play, especially in the retinal artery as a terminal vessel without anastomosis. He cited a case of sudden loss of vision in a young lady with no heart or kidney disease, not especially anæmic, but of a somewhat waxy cast of complexion. It looked like embolism. Treatment was by palpation or percussion over the frontal and

temporal adjacent region, by means of a rubber ball on a stick, and had seemed to be beneficial. He also thought that acute glaucoma might be a congestion caused by a sudden disturbance of the same nature in the circulatory system.

Dr. Bull closed the discussion by expressing his belief that many of these troubles are due to trophic affections, with no disease or affection of any organ elsewhere.

The paper by Dr. E. Smith, of Detroit, Mich., on *Treatment of Abscesses and Ulcerations of the Cornea by Jequirity*, was postponed till a later session by unanimous consent.

Dr. Leartus Conner, of Detroit, Mich., read a paper entitled :

HOT WATER IN THE TREATMENT OF EYE DISEASES.

Dr. Conner stated that that remedy was sought after which would most certainly induce, first, good feeding of the tissue ; second, removal of morbid products and morbid agents ; and third, the promotion of speedy repair. Such an agent is hot water in a great variety of eye affections, such as mild catarrhal and phlyctenular conjunctivitis, corneitis, affections of the sclera and iris, and even, in some cases, retinal hyperæmia. In iritis, where the pupil refuses to respond to mydriatics, hot water will exert a marked effect in assisting dilatation of the pupil. Similar beneficial results in reducing inflammation had been noticed by him in catarrhal and purulent ophthalmia, in relieving the pain in glaucoma and acute dacryocystitis.

There is no morbid state of the eye on which it may not exert beneficial influence. The results reported by divers observers vary with the different modes of using it. The water should be as hot as the end of the forefinger will bear without discomfort. The method preferred by the essayist was to take a common tumbler, fill it to the brim with hot water, and, inclining the head slightly forward, apply the rim of the tumbler to the side of the nose and to the brow and cheek about the eye, which brings the eye itself actually into the water.

The amount of water loses its heat slowly, and does not require frequent changing, and the eye may be kept in hot water with very little trouble for hours at a time. Antiseptics may be added, and the remedy is easily attainable with means for application. It is safe without the watchful care of the physician, while moist heat by any solid substance, as poultices, should never be used except under the direct supervision of the attendant.

Poultices are unsafe and unreliable means of applying heat to the eye; also dirty, especially on denuded surfaces. Compresses are less objectionable, and may be used as a substitute for hot water.

Local effects: 1. Contraction of blood-vessels in and about the eye. Controls hæmorrhages better than cold water, and blanches the tissues in conjunctivitis, blepharitis, phlyctenulæ; and after the use of hot water the ophthalmoscope shows the retinal vessels to be reduced in size. In one case where drawings were made of the vessels before and after, the difference was very marked, and the relief of retinal congestion and improvement of vision very noticeable.

The temperature of the water must vary with the sensation of the patient. The tissues should not be exhausted.

2. Hot water will wash away or destroy all morbid secretions or excretions. At a temperature of 132° F. it destroys the bacillus of anthrax and many others, and many eyes can bear a somewhat higher temperature.

3. It promotes the healthful activity of reparative tissue or protoplasm.

4. It exerts direct power in relieving muscular fatigue and spasm.

Dr. Dudley S. Reynolds, of Louisville, Ky., asked whether the reader of the paper had used hot water, as he had stated, immediately after a strabismus operation, to increase the effect by causing contraction of the cut muscle.

In reply it was stated that contraction was stimulated in the muscle antagonistic to the cut muscle, and the effect increased in that way.

Dr. Thompson, of Indianapolis, Ind., defended the poultice as used in affections of the anterior part of the uveal tract and sclera. He had had excoriations produced by hot water, and then had to use poultices. Chamomile or slippery elm, in cheese-cloth, was with him the preferable form.

Dr. P. D. Keyser, of Philadelphia, Pa., spoke of DeWecker's use of hot water a long time ago in conjunctivitis diphtheritica, as he said, to soften the tissues and hasten absorption. The speaker had found diphtheritic conjunctivitis rare in this country, but membrané on the conjunctiva not so uncommon. He had used hot compresses over the eyes, and kept them hot by spraying with steam directed on the compresses from an ordinary kettle by a forked tube. The compresses should be applied over the eyes alone, and not over the frontal sinus between the eyes.

Dr. H. Power, of London, was in favor of dry poultices rather than moist ones. He has chamomile flowers or hops heated in a dry kettle, stirred till hot through; then applied in a bag or pillow to the part affected. He objects to the use of the steam from the kettle.

Dr. Eugene Smith, of Detroit, Mich., fully agreed with Dr. Power. He thinks moist heat not advisable in ulcerative keratitis.

Dr. P. T. Huckins, of Los Angeles, Cal., believes in the use of heat in these affections, but finds that the length of time during which the heat should be applied has not been spoken of.

Dr. A. Blitz, of Minneapolis, Minn., has never seen bad results, in all cases of conjunctival or uveal inflammations, from the use of hot water.

Dr. Abadie, of Paris, thinks that not so much stress is now laid upon the employment of hot water in many eye troubles. It has gone out of use in phlyctenular conjunctivitis, and purulent and croupous ophthalmia. In corneal affections, internal medication and proper antiseptic applications are far superior. In infectious corneal ulcers, he uses iodoform powder and antiseptic washings. On the other hand, in iritis with much pain

hot applications are good, but morphia, leeches, and internal administration of quinia sulphate, salicylate of soda, etc., are often all that is necessary.

Dr. Herbert, of Philadelphia, wished to call attention to a mode of applying heat that had not been mentioned, that by means of irrigation; the hot water flowing over the inflamed surface was thus kept at a constant temperature.

Dr. Calhoun, of Atlanta, Ga., spoke of an apparatus which he had sometimes used, a thin rubber bag of proper size filled with hot water and applied to the eye. It could have an inlet-pipe to supply fresh hot water, and an outlet to carry away the cooler portions.

Dr. Hotz, of Chicago, remarked that the diversity of modes of application of heat, with such uniformly good results, tends to show that there must be a principle underlying the mere material, or the manner in which it is applied. He should lay down the principle, therefore, to apply heat where there is a stagnation of blood to be broken, and it will reduce pain and and promote recovery. The feeling of comfort that the patient experiences is the best gauge by which to tell the proper temperature in each particular case.

TUESDAY, SEPTEMBER 6TH—SECOND DAY—MORNING SESSION.

Mr. Henry Power, of London, England, presented a paper entitled

MICROBES IN THE DEVELOPMENT OF EYE DISEASES.

After a historical sketch of the earlier researches of Pasteur and those who followed immediately after him in the discovery of the nature and modes of propagation of microbes, and the demonstration of Huxley and others that diseases were developed by these organisms, and that they would grow and form colonies in especial situations, the reader went over the discovery of the micrococcus of syphilis and the gonococcus of purulent conjunctivitis. Chalazion, pterygium, blepharitis ciliaris, purulent conjunctivitis, kerato-iritis, optic neuritis, cere-

bral meningitis, may be considered to be the result of microbic development. The factors in the production of these effects may be as follows :

1. They may first penetrate into the tissues and use up the pabulum necessary for their growth.
2. They may use up the whole of the oxygen, and so deprive the tissue of a necessary element ; or
3. They may throw out what we call ptomaines, poisonous products.

The essayist related a case of a gentleman who after a fatiguing walk of some hours, had a sudden accession of pain in the eye and developed an acute conjunctivitis. His opinion was that, though the tissues in a state of health were able to resist the attack of the ordinary microbes, as found in the air of cities and dense populations, when this power of resistance was diminished by fatigue they were able to effect a lodgment and cause disease. He spoke of the experiment with a long tube, coated in the inside with agar agar or gelatine, and through which microbic air was passed, showing that different varieties of microbes settled and formed colonies at different parts of the inclined tube, illustrating the fact that microbes were heavy enough to settle, and in different degrees.

The lessons which the author of the paper proposed to draw from this were, to avoid all conditions which may lower the condition of the system, remove the patient from the densely populated parts, and in this connection, remember that it has been shown that at sea, at a certain distance from land, the air contains absolutely no microbes. Of course, in crowded ships this condition does not obtain.

Dr. Abadie made a few remarks on the absolute necessity of clean instruments, and cleanliness in regard to all accessories in eye operations, and was followed by Dr. N. Manolescu, of Bucharest, in the same strain.

Dr. Heyl, of Philadelphia, said that it is evident that two general errors in regard to the subject have been developed. One is, that if a remedy will arrest the progress of the microbe

in a gelatine solution, it will be applicable to the diseased conditions produced by that microbe, and also that any antiseptic may be used one for another. The microbe attacks the older and feebler cells in purulent conjunctivitis, and nitrate of silver is of use in destroying these old cells and leaving only the young and vigorous, that are able to resist the microbic attacks. The exacerbations occur as these young cells become older and feebler, and are again cut short by the silver application. Diphtheritic conjunctivitis follows closely the purulent form in course and causation in this connection.

Dr. Heyl found the reason for destructive changes in the cornea in these affections in the different application of the epithelial layer to the subjacent tissue. This was also a factor in hemeralopia, the disease being considered as an epithelial mycosis, the palpebral epithelium being lubricating, while the sclero-corneal is intimately connected with the function of vision.

Hypopyon keratitis is an affection of the lymph itself. There has been a solution of continuity, and the infection gets into the eye. Thus also, in cataract extraction the wound lays the the eye open to the approach of the microbe. In kerato-hypopyon and abscess, a good result was obtained by the use of a salve of agnine having incorporated oleo-resin of cubebs. The application seemed to be quite painful, the patient being kept awake all night by it. A good application is a salve of red cinchona applied on the conjunctiva. A great remedy in kerato-hypopyon is the local application of iodoform to the ulcer.

Dr. B. Baldwin, of Montgomery, Ala., hoped that Dr. Power would also present the surgical side of microbe infection, which is now the liveliest question in eye surgery. He wished to present the other side of the case. In cataract operations he used no protection against the invasion of microbes, except to wash the patient's eye and face. In old hospitals it may be as well to wash and use all these precautions, but in new ones simple attention to cleanliness only is necessary. He referred to remarks by Dr. Lister, in a letter to Dr. Knapp, that

he thought antiseptis not so urgent in eye surgery, the wound being so small. Dr. Baldwin was doubtful whether any better results were obtained now than before the introduction of antiseptis in eye surgery.

Dr. Landolt, of Paris, France, was astonished to see how little attention is paid to antiseptis in eye operations, and that we know too little of bacteria in eye affections. His experience was in favor of a 1 to 5,000 solution of sublimate in extractions. He saw no objection to the solution. It did not prevent union or damage anything.

Dr. Reynolds remarked that he had not for a number of years had suppuration of the cornea after cataract extractions. He insisted on absolute cleanliness, and where that could not be secured declined to operate.

Dr. Keyser remarked that the main argument in favor of antiseptis is its success in operations on all parts of the body all over the world. His predilection was for a saturated solution of boracic acid, and he believed that irritation was caused by the mercuric solution.

Dr. Galezowski, of Paris, thought antiseptis necessary in all eye operations, even in chalazion. He had seen in some cases very dangerous results from neglect of this precaution, suppuration of the eyelids, and destruction of part of the cornea.

Dr. E. Smith, of Detroit, wished to speak on both sides of the question. He thought much was due to cleanliness in operations. He dipped his instruments in alcohol, used saturated solution of boracic acid, and 1 to 5,000 bichloride. He believed that he had a short time ago saved an eye by antiseptis when it had been exposed several hours the day after operation in the immediate neighborhood of panophthalmitis.

Dr. Power, in closing the discussion, said that the remarks of some of the speakers had been somewhat away from the subject of the paper as he had intended it. He drew attention to the propagation of pure cultures from kerato-iritis, and the production of the disease in rabbits.

The practice of dipping instruments, etc., in solution of bo-

racic acid was followed by him in St. Bartholomew's Hospital invariably. He was inclined to think that sublimate in the proportion mentioned is painful. Dr. Baldwin's washing he considered to be really antiseptis. He thought Dr. Galezowski's case of suppuration after chalazion operation was exceptional. He very rarely uses a cataract-knife twice, but prefers to get a new and sharp one from the maker for each extraction. Sharpness and cleanliness of cut are essential to a good result.

Dr. P. D. Keyser, of Philadelphia, Pa., read a paper on

OPERATIVE TREATMENT OF SYNECHIÆ POSTERIORES.

He stated that synechiæ were dangerous to the eye, as a rule, in proportion to the firmness of the adhesion. The danger consisted in the recurrent attacks of iritis caused by the dragging and stretching of the part, resulting in new adhesions, cyclitis, and perhaps atrophy, or sympathetic trouble in the other eye. Of operative procedures, he considered removal of part of the iris not advisable where the centre of the capsule is transparent. After reviewing the various methods in use for breaking up the offending attachments, of which he believed Streatfield's method to be the most successful with a careful and skilful operator, he spoke of their dangers. He objects to Weber's hook, as being too large to manipulate easily and requiring a large opening in the cornea as well as the other methods with loss of aqueous, which prevents contraction of the iris. He exhibited a delicate modified hook which he had used with success for a number of years. The method employed is that recommended by Streatfield, and a small opening is made with any cutting needle, affording opportunity of using the hook with as little loss of aqueous as possible. The adhesion having been broken up, atropia is instilled, and a simple Liebreich bandage applied.

Dr. Galezowski remarked the operation was a very beautiful one, and in many cases afforded good results. He had in five cases of anterior synechia done an operation similar to this, but with a greater hook. The trouble that occurs after is that

fresh adhesions are formed, and as well after iridectomy, which may go on to the production of cataract or irido-choroiditis. He had seen in many cases, after iridectomy, lymph exuded and vision destroyed. If the inflammatory action continues, he advised acupuncture and antiphlogistic measures, and when it has subsided then do the iridectomy, after two or three weeks.

SECOND DAY—AFTERNOON SESSION.

The first paper read was by Dr. A. Mooren, of Düsseldorf, Germany, on

THE SIMPLEST METHOD OF CATARACT EXTRACTION.

He had had an experience of 5,019 extractions since the beginning of his ophthalmological practice in 1855. He had not invented any new instrument. With the progress of antisepsis and anæsthesia, there was less need than formerly of dexterity of manipulation. He regarded cleanliness and disinfection as clearly identical. He avoided the use of carbolic acid on account of its irritant effect. Preparatory to the operation, he washes the whole face of the patient, then instils a few drops of cocaine. Immediately before operating, he washes the everted eyelids with a 3% solution of boracic acid. The operation may be done without a speculum. The only instruments necessary are a Graefe knife, and simple forceps to fix the eyeball. The cut is made downward, and the same knife is used to lacerate the capsule through the intact pupil. Fixation should be abandoned when the patient is restless. Deliver the lens by gentle stroking, then remove the speculum, and rub the closed eyelids over the cornea, and wash again with the same solution of boracic acid. Then a light compress is put on, and retained by means of a strip of adhesive plaster, passing from temple to temple. The plaster should not be allowed to remain longer than four days, on account of its irritant effect upon the skin. In high degrees of

atheroma it is better to do an iridectomy, as there may be a resulting leucoma. In such cases Dr. M. does the combined operation, making the iridectomy upward. In another form of corneal extraction he uses a lance-shaped knife to make the incision and open the capsule. Here he fixes the eye at the lower margin of the cornea. The iris seldom protrudes, and if it does, he cuts it off. In this form of extraction, if traumatic cases be eliminated, there is scarcely any bad result. He spoke of modifications in procedure, where the cataract has a hard, large nucleus, and of the necessity for an iridectomy where a foreign body was in the lens, to guard against its being brushed off by the iris during extraction and left in the eye.

Förster's method of ripening cataracts for a few years back has been practised by Dr. M. It consists in puncture of the anterior chamber and sufficient rubbing of the cornea through the closed eyelid. The introduction of instruments into the eye is not necessary. These cases, when complicated with choroiditis, require to be treated with great caution. One case required a year to mature, and a second had an extraction of a half clear lens fifteen months after the puncture, while a third failed entirely to ripen. The after-treatment is complete physical and intellectual rest.

In cases complicated with constitutional diseases, of course, general appropriate treatment is necessary.

Dr. Galezowski, of Paris, prefers extraction through a dilated pupil without iridectomy by corneal section. He makes a sclero-corneal puncture and counter-puncture, bringing out the knife so as to form an ellipsoid incision. With the same knife he makes a vertical incision in the capsule from top to bottom. Pressure below without the blepharostat extrudes the lens. The incision is made in the upper half of the cornea. The accidents are (1) hernia of iris after operation; (2) suppuration of the cornea; (3) iritis; (4) secondary cataract. To prevent hernia iridis do not bring the incision too far out toward the sclero-corneal margin. Then do not open the eye too frequently. If opened every day after operation it makes the patient contract the lids and press out the iris. Do not open

the eye for perhaps five or six days; only remove dressing to note swelling and condition. To meet the second indication a disk of antiseptic gelatine is introduced into the eye under the eyelids, the lids closed over it, and left so. These disks are permeated with sublimate and cocaine. In three hundred cases only two have had suppuration.

The astigmatism existing after cataract-extraction he accounts for in this way: In almost all eyes astigmatism exists both in cornea and lens, that of the lens correcting or neutralizing the corneal aberration. When the lens is removed this correcting element is lost, so that astigmatism is found where it did not appear before operation. If the capsule is hard or tough it is seized with a pair of forceps, drawn within reach, and cut off with scissors.

Dr. N. Manolescu, of Bucharest, read a paper on

CATARACT-EXTRACTION WITHOUT, AS COMPARED WITH EXTRACTION WITH IRIDECTOMY.

In his simple operations he had trouble from prolapse of iris and other complications due to the difficulty of cleaning out the chamber, and he believes the combined operation to be the more reliable, as it lowers the danger from retained matters and iritic complications. He uses corrosive sublimate as a wash, the toothed forceps for removing the anterior capsule, and closes the wound with a rubber spatula. The eye is dressed with a firm close bandage, and he changes it early.

Dr. Landolt, of Paris, France, remarked there never will come a time when only one operation will be the best for all cases of cataract. He himself was greatly in favor of the combined operation, and thought it was better rather to seek a fair degree of useful vision than a symmetrical pupil.

Dr. Abadie, of Paris, finds that extraction without iridectomy may sometimes complicate the reparative process, and it may be difficult to remove cortical substance. He reserves the operation for cases that are healthy, fully ripe, and which promise ease of extraction and good recovery.

Dr. Marmion, of Washington, said that his faith in iridectomy in cataract-extraction had not been shaken by the arguments that had been advanced.

Mr. Power, of London, acknowledged himself a convert to the operation without iridectomy. Three years ago he had thought he should never change his opinion or method. But cocaine had rendered accidents less likely and given the patient more confidence. He made his incision nearer the sclero-corneal junction than Dr. Galezowski, but agreed with him that the less the eye is looked at the better. A very light compress is to be applied over the eye after operation. If sup-puration occur, attend to the general health. In regard to iritis, he did not think that iridectomy was any protection against it. In regard to secondary cataract, he had it occur just as many times without as with iridectomy. If prolapse of iris occurs during the operation, cut it off.

Dr. Reynolds, of Louisville, Ky., thought that in cocaine and without general anæsthesia we had eliminated the chief sources of failure in cataract-extractions. In carefully selected cases simple extraction might be preferable. In such cases he uses Graefe's knife, and allows the aqueous humor to escape before completing the section, which he makes as nearly as possible in the plane of the anterior face of the iris. In the combined operation he uses Beer's knife. He attaches importance to the way in which the capsule is divided. He makes a flap opening upward, and it frequently tears in other directions. As to eserine after extractions, if the pupil remains large, use it; if small, do not. He never uses fixation-forceps, but steadies the eye with his fingers. He has no use for an assistant in a cataract-extraction. The dressing is a minute film of absorbent cotton, held in place by a strip of adhesive plaster from lower lid to brow, about an inch wide and one inch and a half long, and renewed daily.

Dr. Keyser, of Philadelphia, objected to one operation for all classes of cases. Before the introduction of cocaine he made the downward section; now he makes the cut upward. He tries to remove a piece of the capsule. He never operates

without examining the urine for albumen. If there is albumen he looks out for iritis. He uses a solution of boracic acid, as sublimate seems to irritate the eye.

Dr. J. L. Thompson, of Indianapolis, found that malaria might cause iritis after extractions.

Dr. Baker, of Cleveland, O., concluded that he could not do without an iridectomy. He follows Mr. Wolf's (of Scotland) suggestion, and makes a small iridectomy, leaving a small pupil, delivers the lens slowly and avoids touching the cornea, saving the patient pain after the operation.

Dr. Landolt prefers to make a large iridectomy if he has a large corneal section, and excise as much iris as he can. A small iridectomy is more dangerous than a large one. It allows one to control the field of operation better. He had not had any irritating effect from sublimate solutions in his cases.

Dr. S. M. Burnett, of Washington, has extracted twenty to twenty-five cases without iridectomy, one of black cataract. He thinks there is no form of cataract that cannot be operated on by this method, and there are no more complications than where iridectomy is made. The removal of cortical substance is more difficult without than with iridectomy. He washes out the cortex.

Dr. E. Smith, of Detroit, thought there was no certain operation that could be laid down for all cases. He found that it was not always convenient to do a preliminary iridectomy some weeks ahead, as the patients objected to more than one operation.

Dr. Beaver, of Reading, Pa., asked whether the simple extraction was applicable in weak and flabby corneæ that fell down in wrinkles when the section was made.

Dr. Valk, of New York, has had made an instrument which combines both methods to some extent. He makes a section, then introduces his retracting forceps, which he exhibited, and tucks the iris back out of the way, delivering the lens over the arms of the forceps. The iris is then allowed to fall back to its place, no violence being done it, and giving a perfectly round pupil with no iritis.

The president, Dr. Chisolm, wished that more had been said on the subject of the introduction of antiseptic fluids and eserine into the eye. He submerges the eye in sublimate solution, or one of biniodide of mercury, makes an iridectomy not as large as the corneal section, and simply closes the eyelids and fastens them together with a strip of diaphonous adhesive plaster clear enough to count the eyelashes through, and if no discharge appears leaves it undisturbed.

Dr. Galezowski, in closing, said that he recognized the two classes of cases, in one of which the simple operation was all that was necessary, while in the other the combined operation was the better adapted.

Mr. Power said in regard to antisepsis that he always uses a new knife, and a sharp one, rarely using the same knife for an extraction more than once. He believes the introduction of fluids into the anterior chamber might be dangerous, and he has not seen benefit from the instillation of eserine.

WEDNESDAY, SEPTEMBER 7TH—THIRD DAY—MORNING SESSION.

Dr. C. F. Hotz, of Chicago, Ill., read a paper entitled

RESTORING THE NORMAL POSITION OF THE FREE TARSALE BORDER IN TRICHIASIS.

The essayist began by the introduction of a few anatomical facts bearing upon the subject. He showed that the free edge of the tarsal cartilage in the normal eyelid is placed at an angle of ninety degrees to the surface of the eyeball, and that the eyelashes are inserted at an angle of about ninety degrees to the free border of the cartilage. The angle made by the hairs with the free border may be considerably altered, as in blepharitis ciliaris, without the hairs touching the cornea or surface of the globe. But if the free border of the cartilage is turned inward by shortening of the conjunctival surface of the cartilage from shrinkage caused by inflammation, then it is easy to see how the hairs will sweep over the cornea. This may be

remedied either by lengthening the posterior or shortening the anterior surface of the cartilage. It is not necessary, nor does it occur that the curve of the cartilage is changed. Lengthening the posterior surface is impracticable, but it is proposed to show how the position of the free edge can be restored by shortening the anterior surface. An incision is made just below the upper border of the tarsal cartilage, the lid being stretched downward by an assistant, and the skin and muscular tissue dissected off from the cartilage down to the roots of the cilia. Then an incision is made directly back through the cartilage to the conjunctiva, met by another starting from a line about two millimetres above, and the wedge-shaped piece removed. A narrow ribbon of skin being now cut from the edge of the flap, it is replaced, and the sutures carried in through the edge of the flap, then through the upper border of the cartilage, and out through the upper margin of the incision in the lid. The result of this procedure is apparent, the apposition of the edges of the wedge-shaped wound of the cartilage is good without sutures, and the normal appearance of the lid restored. To avoid cutting through the conjunctiva when making the incision through the cartilage the tactile sense of the finger placed on the inner side of the conjunctiva at the free border is sufficient, but a buttonhole at this point does no harm, and does not affect the result or the healing.

Dr. B. Pitts, of St. Joseph, Mo., next read a paper on

THE BEST METHOD OF OPERATING FOR ENTROPION.

His paper was an exposition of the advantages of electrolysis not only in removing the troublesome hairs which had assumed faulty position, but also in producing resolution and absorption of the thickened and infiltrated tissues, and in this way, even when relief was only partial, preparing the way for the easier performance of blepharoplastic operations.

Dr. Jones, of Chicago, Ill., spoke of the importance of the subject and the uncertainty of the ultimate result. He had seen several cases where the immediate effect of Dr. Hotz's

operation was all that could be desired, but would like to know if the relief was permanent. Some of the cases did not appear so well later on.

Dr. Holcombe, of New York, spoke of a method which he had put into practice, of placing the hairs in position, turned away from the cornea, and holding them in that position by silk surgeon's plaster. He had invariably had excellent results and renewed the application from time to time as required.

Dr. Frothingham, of Ann Arbor, Mich., thought that Dr. Hotz's operation will give better results than anything we now have. The principal trouble will be in reducing the relaxation of tissue.

Dr. D. A. Thompson, of Indianapolis, Ind., said that while country doctors could not muster as many cataracts as some of our foreign brethren, they had an abundance of this variety of trouble. He thought that no one operation would ever be found suitable for all these cases, and that procedure must be modified to suit circumstances.

Dr. Keyser, of Philadelphia, had considerable success by removing the entire cartilage.

The President said that Dr. Hotz had apparently dropped the idea of curving out the cartilage, and wished to know the reason. The reply was that the idea of the incurvation of the cartilage had been found to be incorrect, and that therefore there was no need to alter the curve.

Dr. E. Landolt, of Paris, France, read a paper on

OPERATION FOR STRABISMUS.

He called attention to the marked peculiarities distinguishing this from all other operations on the eye, because it always concerns both eyes. Squint is always binocular. A man with one eye does not squint. A cyclops has no squint. Cataract and other operations may be done without taking into consideration the condition of the other eye, but not so with strabismus operations. He dwelt upon the precautions to be taken for the success of the operation, and the causes of con-

vergence and divergence. A most powerful aid in the correction of squint is the desire for binocular vision. Without binocular vision there is only an apparent cure, a cosmetic effect, because it leaves out the most powerful aid in the cure of strabismus. It is necessary before operation to determine the nature and measure, the degree of the refraction and accommodation, to find how far vision has been lost, and to remedy it if possible. The agents for this purpose are atropia, glasses, cessation from work, and orthoptic exercises. He never operates without satisfying himself that he has got the full effect of non-surgical measures. If the correction is made in the child while young and without these precautions, divergence may occur later. The difficulty of determining beforehand just how much to do to get a certain effect was remarked, and that it was better to do too much than too little. It is easier to diminish than to increase the effect. Dr. Landolt never operates on two homonymous muscles at once. He rather does a tenotomy of one, and an advancement of its antagonist. The remedies for over-effect in operations for convergent squint are stoppage of atropia, removal of stitches from advanced muscle, and use of the other eye. No case should lose its power of convergence or divergence after the operation, as without that power binocular vision would be impossible. If divergence persist, advance the tenotomized muscle. This can easily be done to the tenth or twelfth day.

In divergent squint, on the other hand, the danger is in doing too much. If the divergence is of long standing and the eye amblyopic, then tenotomize with advancement, or do two tenotomies. Do not use atropine, but exercise the eye in the required direction. He often prefers advancement to tenotomy to remedy faulty position. It is more complicated but not more dangerous, and has a greater and more favorable effect than tenotomy. The operation for strabismus is not to be considered as a cure, but only as an adjunct to orthoptic treatment.

THIRD DAY—AFTERNOON SESSION.

Dr. George F. Stevens, of New York, read a paper on
SOME IMPORTANT PROBLEMS RESPECTING INSUFFICIENCY OF
THE OCULAR MUSCLES.

He said that anomalies of the ocular muscles were of as frequent occurrence as those of refraction and accommodation, while the literature of the subject was very scanty, and what existed would lead one to infer that only one of the muscles was liable to insufficiency—the internus—while the deviations in other directions had been ignored or barely mentioned.

The object of the paper was stated to be to suggest certain problems, rather than to explain apparent contradictions. For instance, a case showed with a prism over one eye, insufficiency of the externi of 8° at twenty feet, and at one foot insufficiency of the interni of 10° . There was an adducting power of 50° . Now, there could not be an insufficiency of both interni and externi at the same time. Another case, with the prism eliminated from the question, had diplopia, homonymous of 4° at twenty feet, and crossed of 5° at two feet. Here seems to be a contradiction of results and a problem to explain.

Dr. Stevens then entered into an explanation of the terms which he used in designating the muscular variations. He uses Orthophoria to express the correct equable balance; Heterophoria to express any departure from it. He divides Heterophoria into Esophoria, a tending of the visual lines inward; Exophoria, a tending outward; and Hyperphoria, a tendency of one image to rise above the other. Latent heterophoria is as common as errors of refraction are, but is often overlooked, and is much more difficult to discover. In case hyperphoria exists, in what way are we to determine in which muscle the fault lies? Again, how shall we determine the absolute amount of anomaly and the best manner of procedure? Dr. S. then detailed his own mode of examination, always prescribing

prisms of a degree somewhat less than the hyperphoria. He believed it was better to correct too little than too much. He does not believe that prisms are curative or permanently beneficial, but that they are of much use in diagnosis.

Dr. J. F. Fulton, of St. Paul, Minn., in his paper, entitled the

ADVANTAGES OF EARLY OPERATION IN STRABISMUS.

spoke of the difficulty of overcoming diplopia or amblyopia where they exist after operation. He agreed with Soelberg Wells, that suppression of the image results in amblyopia from disuse, where the trouble occurs in children, and even in cases where the difficulty is of a later date. He favors operating in children at an early date. If operation is not admissible, then the other eye should be covered, and the squinting eye exercised carefully at short intervals. Amblyopia met with in strabismus is either primary or secondary. If primary and congenital nothing can be done, but he thought many cases were secondary and due to the same cause as the squint. The vision of the defective eye sometimes rapidly deteriorates when the image is suppressed. A case in point was one where $V. = \frac{20}{xx}$ in the right eye, and $\frac{10}{xxx}$ in the left, raised to normal by a suitable glass. Some time after the fixing eye was lost by accident, when the left eye was found to have only $\frac{20}{1xxx}$. Other cases were quoted, one of two members of the same family, one of whom was operated on, with the result of improving the vision from $\frac{20}{xl}$ to $\frac{20}{xxx}$, while in the other, which was let alone, the degree of strabismus remained stationary, but the amblyopia increased.

Dr. C. H. Abadie, of Paris, France, read a paper on

FAULTY EYE MOVEMENTS AND THE MEANS OF REMEDYING THEM,

which was most concise and exhaustive. He reviewed the modes of diagnosis, particularly in relation to the differentiation between those cases that require complete and partial

tenotomy, and dwelt on the ability to control the amount of correction by removing more or less of the muscular fibres. It is easy to change a partial tenotomy into a complete one, if it be necessary.

Dr. E. O. Shakespeare, of Philadelphia, Pa., read a paper entitled

ON THE STRENGTH OF THE SUPERIOR RECTI MUSCLES AS A
CAUSE OF ASTHENOPIA.

He found many cases of asthenopia not relieved by correction of the refraction, and external and internal recti in which there was want of proper action of the superior or inferior recti. In testing, we may find that the displacement of the image is greater when a prism is placed over one eye than when over the other. If you use a correcting prism you will find one superior rectus stronger than the other. To correct the muscular error, if there is an error of refraction, he descen-
tres the lenses, and if no refractive error is present, then he puts on prisms.

Prof. F. Manolescu read a paper on "Tenotomy of the Superior Recti" in certain cases of *Conjunctivitis Granulosa*. The object of this tenotomy is to turn the globe downward to carry the cornea out of the way of the upper lid and thus prevent pannus from friction.

Dr. Landolt gave a demonstration of his method of strabometry, and showed how easily the patient and tapes were placed in position, and the accuracy of the result. The tapes are made by Dubois, rue Monsieur le Prince, Paris.

Dr. H. Power, of London, after stating that it was not so long since the operation was done like dividing a tendon in orthopedy, said that he is not now so certain as formerly of a positive cure. A great deal of care is now taken of the cases before operating, and even with it all we will have cases that appear to be just as bad after operation as before.

Dr. Shakespeare rose to ask about the successive removal of muscular fibres by Dr. Abadie in small degrees of insuffi-

ciency. He wished to ascertain something of the permanency of the relief afforded.

Dr. Landolt, in replying in the absence of Dr. Abadie, said that he could not answer that question, as he had never done that operation, and probably never would do it. He always divided the whole tendon. He believed that Dr. Abadie claimed a very good and durable effect.

Dr. G. S. Norton, of New York, asked if Dr. Stevens would tell what was the matter where both external and internal insufficiency appeared to exist, without hyperphoria. The doctor replied that that was just one of the problems he had submitted to the Section, and that he did not know.

Dr. J. A. White, of Richmond, Va., spoke of the great value of Dr. Landolt's paper, and added a few remarks on his own results in advancement of the capsule, with which he had obtained as good results in cases of considerable degree as by advancement of the muscle.

Dr. Thompson, of Indianapolis, was afraid that after all a large proportion of cases return to their original condition.

The President submitted a question as to the time for operation.

Dr. D. S. Reynolds, of Louisville, Ky., suggests the exercise of the retina with strong lenses, even where considerable amblyopia exists, with the hope of improving vision before operating.

Dr. B. J. Baldwin, of Montgomery, Ala., is satisfied that there are many cases in which amblyopia may be prevented by an early operation. A year or two ago he believed that amblyopia was congenital, but he does so no longer.

Dr. Landolt, in closing, thanked the section very heartily for their kindness and indulgence, and expressed his pleasure at the free discussion which had been drawn out.

Dr. A. G. Heyl, of Philadelphia, Pa., then addressed the Section on

ABNORMALITIES OF THE VISUAL AXIS.

He said that the definition of the visual axis is involved in

obscurity, and is as well a matter of extreme importance. He reviewed the terms and definitions at present used, showing their incorrectness, as "*Gesichtslinie*, *Blicklinie*," and their mechanical and not physiological basis. Collimating axis is better, but it belongs essentially to monocular vision, in which one eye dominates over the other.

His true definition is a line from the macula, directed directly in front when the eye muscles are in a state of rest or equilibrium. It is a conception low down in consciousness, as is the conception of the median plane.

Through the pull of the tendons on the sclera, the recti muscles keep the macula pointing straight ahead. He then entered into the subject of the origin of the macula—whether from the foetal cleft, which would call for a rotation of at least ninety degrees, which is said to have been observed. Then he says: "My position, for want of a better, is that the pull of the recti, antagonized by the ciliary muscle, is the factor in the production of the macula." The position of the macula to the outside of the centre, he accounts for by the antagonism of the three third-nerve recti to the one abducens, causing the point of equilibrium to be moved to the outside.

Dr. Ole Bull, of Christiania, Norway, wished to know how Dr. Heyl accounted for the existing of two maculæ in some birds with restricted vision.

Dr. Heyl in closing, in answer to Dr. Bull, stated that he knew that those cases existed, but that he would have to examine the arrangement of the muscles before being ready to explain it. He thought the same process of tension might take place in two different directions.

THURSDAY, SEPTEMBER 8—FOURTH DAY—MORNING SESSION.

Professor X. Galezowski, of Paris, France, opened the session by reading a paper entitled

THE CURABILITY OF DETACHMENT OF THE RETINA.

He stated that the pathology of the disease is not entirely clear.

The writer had observed in twenty years, among 152,000 persons, 789 detachments, of which 87 were in both eyes, 63 in emmetropic and hypermetropic eyes, and 194 were traumatic; 13 occurred after extraction of cataract, 18 were syphilitic, and 4 in sympathetic affections. Tumor was found in 10 cases. Twice only he found detachments in retinitis albuminurica, although he frequently saw this affection. Cataract is very frequent in detachment of the retina.

Occasionally tearing of the retina is noticed, with the corpus vitreum introduced behind the retina, between the choroid and the retina. He could say that the rupture of the retina is not so frequent, and considers it the consequence and not the cause of the detachment. Professor Graefe has said that the detachment is not curable, and the function of the retina is not restored. Dr. Galezowski had seen a case which showed alterations in the retina at the place of detachment, which had been completely cured. The patient gave the usual history of trouble with the vision, coming on suddenly and continuing for one or two or three months, with afterward recovery of sight. He explained the appearance of the fundus as seen by the ophthalmoscope, and illustrated them on the black-board.

The conditions predisposing to detachment were said to be (1) choroiditis; (2) liquefaction of the corpus vitreum. In treating these cases he begins with antiphlogistic treatment, atropia, rest, etc., and he had in seven cases a complete cure—the retina completely adherent, and around the line of the separation atrophy, with pigment-deposit and choroiditis disseminata. The first indication is antiphlogistics. Apply every month two, three, four or five leeches, then atropine, and warm and cold compresses alternately, and in the intervals between the leeches he applies derivative plasters. Inside of five months he has completely cured detachment of the retina. Mercury and potassium iodide are also useful where exudation is present or in cases of constitutional disease.

Fifteen years ago he proposed iridectomy to stop the inflammation of the choroid, but it did no good in that way, although it stopped the iritis. Now he proposes a new opera

tion. He considers the exudation behind the retina as being of the same character as the effusion in pleuritis or peritonitis, and has had an instrument (which he exhibited) made to aspirate the fluid. The instrument is a syringe with a stop-cock and an aspirating-needle. He introduces the needle through the sclerotic at a considerable distance behind the ciliary body and passes it into the globe for some distance. Then he exhausts the air by drawing out the piston. If the needle-point is too far in, no fluid appears in the barrel of the syringe, but on withdrawing the needle gradually the fluid appears, and one, one and a half, or two grams, is generally obtained. There is no inflammation after the operation. By this means two out of seventeen cases operated on were completely cured and there is a certainty of amelioration in all cases.

In old cases he introduces a curved needle from behind forward through the sclera and the detached retina, before introducing the aspirating-needle; and when the fluid is drawn off a catgut ligature is drawn through as a seton and brought tight.

Dr. Abadie, of Paris, France, spoke on the causation of detachment in myopes, setting forth the gradual stretching of the sclerotic in staphyloma and its drawing away from the retina as a cause of the detachment, with remarks on treatment.

Dr. Keyser, of Philadelphia, spoke of Graefe's method of tearing the retina through the detachment with a needle, of DeWecker's trocar, and of the double-needle method. He had never been able to get a permanently good result, although the immediate effect was sometimes very pleasing. He thought well of Dr. Galezowski's instrument, but wished to know how it would act in old cases.

J. Richardson Cross, Esq., F. R. C. S., of Bristol, England, said there was no doubt that the subject was an exceedingly difficult one. He had treated a case with diaphoretics, had pushed pilocarpine, and used the other commonly accepted means of relief, with no change till now. He had done sclerotomy in three eyes, two in one girl. One, in a woman, did no good.

[TO BE CONCLUDED]

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RETINOSCOPY.¹

BY A. R. BAKER, M. D., CLEVELAND, OHIO.

It would be an interesting study to determine some of the causes which lead the medical profession to accept a new drug upon the most meager testimony when originating from the most obscure sources, while a new surgical procedure or instrument of precision in diagnosis is summarily rejected, and if ever brought into general use it is only after a long and persistent fight against the prejudices of the profession. This may be illustrated by the many long years which abdominal surgery took to gain the sanction of the medical profession, compared with the almost universal acceptance and use of cocaine as a local anæsthetic within a few weeks. Or even with jequirity, an agent quite as potent, and liable to very great harm when used improperly, which the merest tyro in medicine does not hesitate to employ and is used even by those who never dream of using the ophthalmoscope.

Although retinoscopy has been used very extensively by general practitioners and specialists in England and France, it has been almost entirely ignored by German and American practitioners. While Cuignet, Parent, Chibret, Forbes, Mor-

¹Read before the Section of Ophthalmology of the Ninth International Congress

ton, Hartridge, Juler, Landolt and a host of others have written articles upon this subject extolling its value and urging its superiority and adoption over other methods of determining errors of refraction, no less an authority than Prof. Hirschberg of Berlin remarked, in a laughing manner, when the writer asked his opinion of the value of retinoscopy. "Oh, that is a *lazy English method*, and don't amount to much." Dr. Loring, in his excellent text book, says: "That it is, in his opinion, the most difficult and least satisfactory of any of the methods of determining the refraction of the eye, and contributes nothing which cannot be more easily and more expeditiously performed by the upright image."

It is unfortunate for any profession to permit national or race prejudice to bias the discussion of any scientific discovery, but the manner in which retinoscopy has been received shows that the medical profession have not risen entirely above these considerations. Retinoscopy was first brought to the notice of the profession by the French, and received by the English and used extensively by them. It was summarily rejected by the Germans and Americans without investigating its merits. It was a favorite theory of Bayard Taylor that the Americans were growing more like the Germans in their literary and scientific work and methods of thinking, if not in physical appearance. This has been particularly true of the medical profession in this country, who have, in a measure at least, seemingly followed the profession in Germany, accepting what the German professor accepts and rejecting what he rejects. He rejected retinoscopy, and true to the prevailing fashion the American rejected it without examining the subject for himself.

But this is not the only element which decided the question in the minds of such acute observers as Prof. Hirschberg and Dr. Loring.

Prof. Hirschberg (if he will pardon the personal allusion) is one of the most accurate men in the use of the ophthalmoscope I have ever met. I remember while in his clinic in Berlin, in 1882, of his examining a number of patients in the dark

room and sending them out for me to prove his ophthalmoscopic findings with trial lenses and test type. The accuracy of his ophthalmoscopic readings, especially in astigmatic cases, was a revelation to me, especially as I had always been rather skeptical as to the ability of anyone to determine accurately the amount of error in cases of astigmatism by means of the ophthalmoscope alone. But, granting that Prof. Hirschberg can determine the amount of error of refraction accurately by means of the upright image, it is not accomplished by everyone in fact very few, can do so.

The same remarks will apply to Dr. Loring to a certain extent, together with the fact that his name is associated with one of the best refraction ophthalmoscopes made. This method of determining refractive errors has become somewhat of a hobby with him, and he could not easily be persuaded that there was a better and easier method.

I believe one of the great objections to the introduction of retinoscopy has been the belief that the present methods are good enough. It has been the aim of nearly every oculist in this country and Germany to learn to determine errors of refraction by means of the upright image. Theoretically, this would seem to be the most rational method, but practically it has been found that few, if any, under forty years of age can practice it successfully, and that no one can do so unless he has a large amount of clinical material to keep him in constant practice. Another reason why retinoscopy has not been better received by the profession in America has been the unfortunate manner in which the subject has been presented to American readers.

The only articles which have been published in this country (Dr. Swan M. Burnett's work on Astigmatism has appeared since this was written) were that by Dr. Jackson, in the *American Journal of the Medical Sciences*, June, 1885, and a brief paper in the AMERICAN JOURNAL OF OPHTHALMOLOGY in July, 1884, by the writer. Dr. Jackson commits the grave error of recommending a plane mirror, and instead of neutralizing the shadow, by means of lenses,

he judges of the amount of error by the distance he is obliged to go from the patient in order to neutralize the shadow. The method recommended by him is not retinoscopy as taught and practiced by the French and English, but merely a modification of the old method known as the "fundus image" test. It has always been recognized and utilized to a certain extent, that in emmetropia at a distance of several feet, when a light was directed into the eye from an ophthalmoscopic mirror, nothing but a red reflex could be distinguished. If the eye was myopic or hypermetropic in a high degree the disk and blood-vessels could be seen. When a plane mirror is used, these vessels will move in a direction against that of the mirror in myopia, and with it in hypermetropia, and by gradually approaching the patient the vessels will become invisible and as you come closer will be reversed. This point of reversal corresponds to the far point of vision, and by measuring the distance from the eye the amount of myopia or hypermetropia may be approximately determined. It is to be regretted that Dr. Jackson has presented this somewhat difficult and, at best, uncertain method of determining errors of refraction in place of the simple, uncomplicated and definite method of retinoscopy as taught in the English ophthalmic hospitals. I like the term retinoscopy, and believe it will be retained as the proper one. At one time I was greatly in favor of substituting the name of "Shadow Test," as I thought that would convey the proper meaning of the method of examination a little more definitely, and prevent the confounding of it with other mirror tests, as Dr. Jackson has done; but I see he uses as the title of his article the very term that I thought would prevent this mistake.

The examination by this method is so simple that I sometimes think much valuable time has been wasted in explaining the method of its performance. I fear that the descriptions have often served to render the subject more obscure. With a few trials I have been able to teach students with no special skill in the use of the ophthalmoscope to use it satisfactorily and with benefit to patients. I know one spectacle peddler

who, making no pretensions to a knowledge of refraction and accommodation, uses it successfully in his business.

In teaching the use of retinoscopy, if possible, I select for examination a person with emmetropic eyes—usually a fellow student. For beginners it is better to dilate the pupil with cocaine.

My ophthalmoscope is furnished with two mirrors attached by means of a screw; one large mirror of about twenty-four inches focus for making examinations by the indirect method and for performing retinoscopy; and one mirror (small) placed at an angle of the usual focus for direct examinations. This is known as Johnson's ophthalmoscope, and is made by Crouch, of London.

I seat the patient with his back to the light and the student opposite at the distance of about three to four feet. I then direct him to reflect the light into the eye of the patient, who is requested to look past the opposite ear of the one making the examination. If the observer has had a little experience in using the ophthalmoscope, he catches the red reflex from the fundus directly. With beginners, I find this the most difficult part to teach. I then direct the examiner to rotate his mirror from side to side slowly and watch the red reflex carefully, and ask him whether he sees a slight shadow moving across the red disk. Most observers see it easily, others require some little time. Beginners often make the mistake of moving their heads instead of rotating the mirror. I then direct them to rotate the mirror in the vertical meridian until they see the shadow again.

I am careful to see that they *rotate* it—not move it up and down. I then place an +1.D in a spectacle frame in front of the eye examined. The examiner will soon tell you he can see no shadow. I then put in a plus lens (having the + 1.D in place, which I do not change during the entire examination) and he again sees the shadow. I direct him to observe closely the direction in which it moves. I alternate plus with minus lenses, and the examiner will soon tell you that with the plus lenses the shadow moves opposite the direction in which the

mirror is moved and with the minus lenses it moves with the mirror.

By leaving the $+1.D$ in the frames, we are not obliged to make the additions and subtractions which are necessary if it is removed, and we go on with the examination just as if it were not there, making the calculations as simple as with a plane mirror.

One of the first questions asked by the student is why do we have this shadow moving in the same direction as the mirror in low degrees of myopia? And why it is necessary to use this $+1.D$ to neutralize the shadow in emmetropia? This is because, with a mirror of twenty-four inches focal distance, the rays of light do not cross before reaching the observer, and an erect image of the illuminated and shaded portion of the retina is obtained the same as when a plane mirror is used.

The following rules [Morton, *Refraction of the Eye*, page 36] are of great practical importance in making these examinations:

1. "If the image of the shadow appear to move in the same direction in which the mirror is moved, and if the rapidity of movement and curvature of the shadow are the same in all meridians we have to do with a simple myopia.

2. If the shadow appear to move in the opposite direction to that in which the mirror is moved (remember in all of these examinations the $+1.D$ is to be left in situ) and if the rapidity of movement and curvature of the shadow are the same in all meridians, we have a simple hypermetropia.

3. The slower the movements of the image the feebler the illumination; and the more crescentric and narrower the shadow, the higher the hypermetropia or myopia.

4. A difference in two opposite meridians, either of the direction or rapidity of movement or of the curvature of the shadow, indicates astigmatism. These two dissimilar shadows moving at right angles with each other—either one vertically and the other horizontally, or both obliquely—indicates the meridian of greatest and least refraction.

5. If the shadow move with the mirror in one meridian and

against it in another, we have a case of mixed astigmatism."

By means of ordinary trial lenses it is easy to measure the amount of error of refraction. If the shadow move with the mirror, we place concave lenses in the spectacle frame until the shadow is neutralized, and the number of lens required will indicate the amount of myopia.

If the shadow moves opposite to the direction in which the mirror is moved, convex lenses are used until the shadow is neutralized, and the lens required to neutralize the shadow will indicate the amount of hypermetropia. In cases of simple astigmatism, no shadow will be seen in one meridian and a shadow moving with or against the mirror in the opposite. By neutralizing this shadow with the appropriate lens, it will indicate the number of the cylindrical glass required to correct the astigmatism. In cases of compound astigmatism it will be necessary first to correct the meridian with the least error of refraction. This will indicate the spherical lens required; and then by correcting the meridian with the greater error, and deducting the lesser from the greater, the cylindrical lens required will be found. Suppose we have a case in which it requires a $+1.D$ to neutralize the shadow in the horizontal meridian and a $+3.D$ to neutralize it in the vertical. To correct this error would require a spherical $1.+D \subset +2.D$ cylindrical axis $90\ 3.D-1.D$.

Cases of myopic compound astigmatism may be corrected in a similar manner, using concave lenses. Cases of mixed astigmatism can be corrected in the same way. Supposing a given case requires a $+2.D$ to neutralize the shadow in the vertical meridian, and a minus $1.D$ in the horizontal $+2.D-1.D$, the following formula would indicate the lens required to correct the error of refraction; spherical $+2.D \subset -1.D$, cylinder axis 180 .

I think one reason why the use of retinoscopy has not come into more general use is the fact that, in order to determine the amount of error of refraction, it is necessary to resort to the use of trial lenses.

One of the great objects to be attained by the numerous

optometers presented to the profession, and this has been almost as fruitful a field for the inventive genius of the oculists as the pessary has to the gynæcologist—has been to do away with the trial lenses. This has also been one of the great advantages claimed for the direct method of examination with the ophthalmoscope.

But whatever other means are made use of to determine the amount of error of refraction, I do not believe we will ever be able to discard the practical test with trial lenses. Often the lenses which are theoretically correct are not the ones practically best adapted to the needs of the patient. I presume my experience has been similar to that of most ophthalmologists, when I say that I frequently find patients wearing simple spherical lenses, selected either by themselves or some travelling spectacle peddler, who have discarded the use of compound lenses which have been fitted with great labor and skill by the oculist.

There is in all these cases an unknown quantity—the accommodation; and the ophthalmologist who keeps this fact in mind, and proves his readings either with the ophthalmoscope or by means of retinoscopy or anyone of the optometers by an actual test with trial lenses, will often save his reputation as an oculist, and render the best service to his patients.

But as it is often necessary to prescribe spectacles when we cannot have the aid of trial lenses, I have made use of the following simple device which occurred to me in an emergency some years since. As already stated, I make use of an ophthalmoscope with two mirrors attached by means of a screw. Simply by detaching these mirrors I have two instruments. First, a retinoscope with a good handle; and second, a series of lenses conveniently arranged for determining the amount of error of refraction, which answers every purpose of a trial case. This latter I give to the patient, directing him to look past my ear through the small hole. I then proceed to make the examination in the usual manner, directing him to turn up the proper lens as required.

I have made use of this simple procedure for a number o

years, and have found it to serve me admirably when away from my office, where I could not have access to trial lenses.

I have found the concave mirror much superior to the plane one. It concentrates the light so that we secure better illumination, and makes it possible to sit at such a distance from the patient that it is convenient to change the lenses without moving. It has been urged that the exercise necessary in walking backward and forward each time a lens has to be changed was of benefit to a physician of sedentary habits. This has not impressed me as of very great advantage. I would still prefer to have retinoscopy characterized as "a lazy English method" and keep my seat.

The advantages of retinoscopy are many. It does not require any expensive apparatus or paraphernalia. It is easy of execution; anyone capable of making an ophthalmoscopic examination can learn to use it in a few hours. It saves valuable time. Cases which formerly took from one to a dozen sittings as long as the patience of my patient and myself would permit, are now disposed of usually in one sitting of short duration.

Although it is necessary to use atropia occasionally to paralyze the accommodation, especially when there is spasm of the ciliary muscle, I find that since I have become accustomed to using retinoscopy it is not necessary to use atropia once where I formerly used it ten times. There is one point on which many observers are at fault; that is in directing the patient to look at the mirror. If instead the patient is directed to look past the ear of the observer at the dark wall beyond, the accommodation is relaxed, the pupil dilated and the examination made comparatively easy and the use of a mydriatic seldom necessary. With a little practice the physician soon learns to distinguish when the accommodation is relaxed by the condition of the pupil.

A retinoscopic examination is more easily performed than an ophthalmoscopic one by the indirect method. It is more accurate as a means of correcting errors of refraction than by the upright image, and the examination is made as quickly as with the optometer.

We are enabled to examine cases and correct the error of refraction without the assistance of the patient—a very important matter with children, ignorant people and those of feeble intellect. We are enabled by means of retinoscopy to fit spectacles accurately in cases of amblyopia as the result of the excessive use of tobacco, alcohol, etc., and especially as the result of squint. In cases of nystagmus, in which it is impossible to fix the eye, its use is invaluable.

I have purposely omitted all allusion to the optical principles involved, as they have been fully discussed in the many papers written on this subject. I have endeavored to present this subject in a plain, practical manner, and if this incomplete paper should be the means of creating enough interest in retinoscopy to lead you to give it a fair trial, I am sure you will be surprised with what ease difficult cases of error of refraction can be corrected.

INTERNATIONAL MEDICAL CONGRESS.¹

SECTION OF OPHTHALMOLOGY.

DR. J. J. CHISOLM, OF BALTIMORE, MD., PRESIDENT.

Secretaries.—Drs. A. Alt, of St. Louis, Mo.; J. A. White, of Richmond, Va., and R. L. Randolph, of Baltimore, Md.

[CONCLUDED FROM PAGE 272.]

Dr. E. Landolt, of Paris, France, recognized three kinds of detachment. The first is due to choroidal exudation; the second, detachment in myopia; and the third, traumatic detachments. For the first, the treatment is perfect rest and compress dressing. He quoted a case which was cured and had remained well for three years. In the second class surgical interference may be justifiable, because there is scarcely any hope of restoration of vision in the part affected. He illustrated by a diagram his mode of operating with a Graefe knife, and remarked on the possibility of sucking out vitreous if the syringe was employed. For the third variety, traumatic detachments, there were no general rules. Some are restored with simple rest, and others resist all treatment.

Dr. E. Smith, of Detroit, Mich., had been struck with the remarks of Professor Abadie. In his first case he introduced an acupuncture needle, and the immediate result was brilliant; but the permanent improvement was *nil*. He preferred to do the operation suggested by Dr. Wolf, of Scotland, and would hope to get up adhesions to tie the retina down to the wound. Professor Galezowski's operation looks rational, if he does not puncture the retina.

Dr. Holcombe, of New York, remarked that Dr. Galezowski, when he spoke of a cure, did not mean complete restoration of vision, but only reduction of the detached portion, and its restoration to its original plane. He also described Sichel's operation.

Dr. Reynolds, of Louisville, wished to know whether it were a fact in the eye as in other organs, that frequent tapping is followed by increased accumulation.

Dr. Calhoun of Atlanta, Ga., wished to know what advantage is to be obtained by operating in cases of this kind of long standing. The eyes are blind, and vision is not restored, and the operation may set up inflammatory action. He had done sclerotomy many times, but without satisfaction.

Mr. Power, of London, Eng., found it difficult to understand how there could be restoration of vision in these cases of detachment. The pigment layer is detached from the retina and left behind, and does not reattach itself again as before. He believed there might be an apparent restoration where the detached portion had hung down over the good part like a bag, and after reduction of the detachment there was an apparent improvement in that part of the retina.

Dr. Behrmann, of Washington, D. C., wished to answer Dr. Calhoun's question by relating the course of a case that had come under his observation.

Dr. Galezowski remarked, in closing, that he had only done the operation in bad cases. If it had been done in all cases, we might get a better percentage of favorable results. An antiseptic might be injected into the cavity. It is possible for the retina to resume its function of vision, but even if it were not, the arrest of the process and saving the rest of the vision is of value.

Dr. J. A. S. Grant (Bey), of Cairo, Egypt, then read a paper contributed by Dr. Brugsch (Bey), of Cairo, who was not able to be present, on

THE PREDISPOSITION TO GLAUCOMA.

He said that increased tension, the recognized test-symptom of glaucoma, might be produced in two ways, either by increased secretion or by retention of the secretion, when normal in amount. He was inclined to think that the theory of retention was, at least in some cases, the one which appeared

reasonable. It was a question whether eyes with small corneæ were more liable to be affected, and he gave some statistics which seemed to point in that direction.

The predisposition of the Semitic race to glaucoma is remarkable. In other races it occurs in the proportion of one to one hundred, here the proportion is four to one hundred. He had been surprised by finding children affected with glaucoma. The cornea of the pure Egyptian is decidedly smaller than that of other races, and he had been endeavoring to find whether the whole globe was also smaller, but his researches had been hindered by the trying climate, which produces decomposition in fresh eyes so rapidly. After iridectomy there appears to be a relaxation, and even an enlargement, of the corneal circle, as you can see if you notice that the coloboma will sometimes appreciably enlarge a considerable time after the operation.

AFTERNOON SESSION.

Dr. A. G. Sinclair, of Memphis, Tenn., reported

A CASE OF RETINAL GLIOMA OF BOTH EYES.

A young child was brought to him with the history that some time before it was noticed not to see well, and soon appeared to be blind; then a white and somewhat lumpy appearance was observed in the pupil. Soon afterward black lines were noticed over the surface of this appearance, the retinal vessels. On examining the eye Dr. Sinclair found congestion of the conjunctival and episcleral vessels, pupil slightly dilated, tension somewhat above normal. The same appearance was observed in both eyes, except that the left cornea appeared somewhat abraded in the centre. Enucleation was proposed and was consented to. The right eye was removed together with about one-half inch of the optic nerve, and the left eye and the whole contents of the orbit, as far as possible, without cauterization.

A careful and complete pathological examination of the right eye was made by Dr. T. Mitchell Prudden, Director of

the Physiological and Pathological Laboratory of the College of Physicians of New York, who reported it as a *glio-sarcoma*.

The left eye and its appendages were examined by Dr. Carl Heitzmann, of New York, and his report came to the same conclusion. These two examinations and reports were each made without any knowledge of the other.

The case has now been observed for six years since the operation, and there appear to be no signs of the return of the disease, and the child is perfectly healthy. No heredity was discovered.

Dr. Keyser, of Philadelphia, remarked that in cases of this sort he was doubtful if the child would live more than eighteen months or two years. One case of his had lived seven years, and one died eighteen months after operation of glioma of the brain. He was doubtful if the successes were cases of true glioma.

Mr. Power, of London, Eng., expressed the same doubt, although he has had some successes also.

Dr. Galezowski, of Paris, has operated for the removal of this disease, and one recovered and was afterward healthy. He had only seen four cases.

Dr. D. S. Reynolds said that he thought it is a malignant proliferation conveyed through the lymph-channels. When it originates in the retina he saw no reason for its not being successful. He had had a case where he had enucleated both eyes, which were invaded simultaneously and equally. There was immunity for ten years.

Apropos of Dr. Reynold's remarks as to the origin of glioma, whether in the optic nerve or retina, Dr. R. L. Randolph, of Baltimore, M. D., remarked that in a microscopic examination of a gliomatous eye very recently, he found the optic nerve-fibres pressed apart by the growth, which latter extended up to the severed end of the nerve. The whole optic nerve tissue was disorganized and, so to speak, monopolized by the growth. He inferred that the growth must have had its origin in the optic nerve.

Dr. H. C. Paddock, of New York City, read the next paper, entitled,

ERGOT OF RYE IN OPHTHALMIC PRACTICE.

No mention is made of this remedy in the earliest works on medicine, and even until very lately it has been considered to be a medicine for the obstetrician alone, and only to be good to stimulate contraction in the uterine muscle. The action of ergot is to promote contraction of the blood-vessels, as well in other organs and tissues as in the uterus, and especially in the blood-vessels of the eye. Soelberg Wells in his work mentions it as a valuable remedy in congestions, episcleritis, etc., while Hammond says it possesses the property of contracting unstripped muscular fibre. It is certain that it does diminish the calibre of the vessels, and has a good effect in obstinate affections. It is a rational remedy, and nothing more is claimed for it than its general therapeutic properties. He gave a few cases in which it had seemed to exert a marked beneficial effect.

In the case of a woman with conjunctival congestion and pain and discomfort, the whole trouble was stopped on the third day. In still another case, Mrs. B—, twenty-five years of age, there was conjunctivitis, iritis, retinitis, and ciliary neuralgia. Under ordinary treatment she improved for four or five weeks and then came to a standstill. She was then given ergot, and was discharged cured in a few weeks. In regard to the use of ergot, he begged to remark that it is a reliable drug, that it must be used in maximum doses and for several days, and that it is a good tonic; that atropia should be used in iritis, and rely on general treatment for any complication that may arise.

Mr. Power, of London, England, then read a paper written by Mr. P. H. Mules, of Manchester, England, who was unavoidably absent, entitled

EVisCERATION AND THE ARTIFICIAL VITREOUS.

The object of the paper was stated to be to lay before the section the results of an operation which was intended to pro-

duce an improved appearance over the result in evisceration alone, with a clean cavity free from muco-pus. The mode of shrinkage after evisceration was discussed, and a blackboard demonstration of the method of operation given. The incision is made through the conjunctiva around the cornea, elliptical with its long axis horizontal. The conjunctiva is dissected back for a short distance, and an elliptical incision made through the sclera of about the same size and in the same position as that in the conjunctiva. The contents of the globe are then carefully cleared out, which is easily determined by the view of the white sclerotic in the interior of the eye. The glass ball is then introduced, the edges of the scleral wound carefully fitted together over the ball, care being taken to have no tension at the point of union, united by sutures, and the conjunctiva then brought together and sutured. There may be considerable reaction and some pain, which is treated in the usual manner. Mr. Power had done the operation about a dozen times, and had three bad results. One suppurated, and in two the wound yielded and the glass globe was pushed out. Catgut sutures are used.

Mr. Cross, of Bristol, England, thought Mr. Mules' operation would be a permanent one. The shield over such a globe has a better motion than any artificial eye on a natural stump can have, because the muscles have been placed in a position more nearly corresponding to that in the natural eye. It does not make any difference whether you use a glass globe or a silver, or, as has been lately recommended, a celluloid one. An advantage of this operation is that the lower lid is preserved, and is not gradually obliterated so that the shell cannot be retained. It cannot be said that Mules' operation will prevent sympathetic ophthalmia, because we cannot entirely clean out the globe. There may be affection of the lymphatics exterior to the globe already before evisceration, and it is, of course, impossible to reach them in this operation. Mules' operation is not to be compared with enucleation in sympathetic ophthalmia. We operate in sympathetic ophthalmia to save the other eye. It is not a question of appearance, but of sight.

Dr. Galezowski, of Paris, would divide the question into two parts—evisceration, and introduction of the glass ball. He saw evisceration first 14 years ago, with Professor Richet, in Paris. Great inflammation resulted, and it was not possible to introduce the glass ball. Enucleation was done six months after and the patient got well. He saw another case four months ago. Six months previous a good operation had been done, but a sinus had formed in the region of the wound. Treatment with antiphlogistics, antiseptics, etc., was of no avail. Enucleation was done and all was well. One year is not long enough for a final conclusion in the matter of result. In sympathetic ophthalmia there must be danger if we leave the smallest piece in the eye, and the enucleation must be completely and carefully performed, so as to leave none of the sclerotic attached to the nerve.

Dr. Baker, of Cleveland, O., as an illustration of the ability to retain a foreign body in the eyeball with impunity, related a case which had occurred to him. A man had his eye burned severely with sulphuric acid, so that an unsightly ball was left, with no cornea. He put in a glass button like a collar-button, and the man had been wearing it comfortably ever since.

Dr. Keyser, of Philadelphia, Pa., stated that he would try Dr. Mules' method. He had had very severe inflammation occur after evisceration. To illustrate the danger of sympathetic ophthalmia, when enucleation is not effectually performed, he related a case where a small button of sclerotic was left on the divided nerve. He advised to get it all out, but it was not thought worth while, and sympathetic ophthalmia set it. He believed it was better to do evisceration early.

Dr. Dibble, of St. Louis, had seen two cases of bony deposit inside the sclerotic, and believed that in such a case the pressure of the glass ball would produce irritation and perhaps sympathetic trouble.

Dr. E. Smith, of Detroit, had seen Dr. Power do one of these operations, and although Dr. Power had predicted considerable chemosis and severe reaction, there was no trouble whatever, and a happy healing resulted. There was not even a bad

symptom. He laid stress upon the fact that the edges of the cut sclerotic should just meet, not overlap or strain.

Dr. R. L. Randolph, of Baltimore, Md., read a paper contributed by Dr. H. Gifford, of Omaha, Neb., entitled

FURTHER CONTRIBUTIONS TO SYMPATHETIC OPHTHALMIA.

It related to the posterior lymph-stream, and detailed the results of experiments with injections of India-ink and anthrax. The course of the injections was ascertained by examining the eyes at periods after injection, and it was found that, even in neurectomized eyes, the coloring matters or anthrax bacilli had reached the brain from the posterior chamber; even where the cerebral end of the cut nerve contained none, showing that there is a current from the posterior part of the eye back to the brain, independent of the channels of the optic nerves.

Mr. J. Richardson Cross, of Bristol, England, next contributed a paper entitled

RETINOSCOPY; IT PROMISES A RAPID AND RELIABLE METHOD OF ESTIMATING ERRORS OF REFRACTION, AND IS A TEST OF THE GREATEST PRACTICAL VALUE.

He stated that the full correction of the refractive error is not the one that is always most likely to be accepted by the patient, when determined by the upright or direct image method. With trial glasses it is often necessary to use atropine, but in retinoscopy he has only found it necessary to use atropine in cases of spasm of accommodation. In all other cases cocaine is quite sufficient. Either the plane or the concave mirror may be used. The production of the image at the far point of the eye in myopia is the important unit in the question of retinoscopy. The shadow observed in myopia is that of the aerial image projected from the observed eye. With illumination, no movement, and no shadow, the observer must be near the conjugate focus of the rays. It is a usual thing to have one constant point to calculate from and work from, and

the usual standard of a little over a metre is objectionable, because it is necessary to get up and approach the patient to make every change of glasses. Dr. Cross could use an optometer made by Doyne, which he exhibited, at a distance of eighty centimetres, which obviated the necessity of moving with each change of the patient's glass. Mr. Cooper has brought out a somewhat more complicated optometer, by which you are enabled to sit at the full distance and turn the disk.

The proper point to estimate the refraction in the patient's eye is the macula, but it is not easy; the disk is easier, but not so accurate on account of the frequent occurrence of the physiological cup. The writer preferred to take a point midway between the two, which could easily be done by making the patient look at the other side of the face.

The results of retinoscopy are quite satisfactory; unsatisfactory in only about ten per cent.

The differences between the result with and without atropia are slight in degree, in a spherical direction, and do not exist to the cylindrical correction. A much higher degree of latent hypermetropia is discovered by retinoscopy than by trial lenses.

Drs. Keyser and Reynolds rose to questions of information as to the abolition of the accommodation in the use of the method, and

Dr. Galezowski stated that he liked the method, but did not like the name. He believed the shadow to be produced by the changes in the cornea, and that the proper name is keratotomy. An advantage is that you can make a diagnosis of the refraction without atropine.

Dr. Galezowski's assistant, Dr. Parent, had described it very accurately, and used the name keratotomy. In proof of its being the shadow in the cornea, the best diagnosis of staphyloma of the cornea could be made by this method. There is no reason at all for the term pupillotomy.

Dr. A. R. Baker, of Cleveland, O., also read a paper on

RETINOSCOPY.

Although retinoscopy has been extensively employed by gen-

eral practitioners and specialists in England and France, it has been almost entirely ignored by German and American practitioners. While many competent observers have written extolling the method, no less an authority than Professor Hirschberg, of Berlin, remarked in a laughing manner, when the writer asked his opinion of the value of retinoscopy, "Oh, that is a lazy English method, and don't amount to much." And Dr. Loring, in his excellent work, thinks that it does "nothing which cannot be more easily and more expeditiously performed by the upright image."

Probably one reason for rejection of this method by Professor Hirschberg and Dr. Loring is their extreme accuracy in the use of the ophthalmoscope. But this accuracy was, he believed, limited to only a very few, and it required a large amount of clinical material to continue proficient, and few, if any, master the ophthalmoscope sufficiently under forty years of age to become proficient.

In teaching the method it is better to select an emmetropic eye for the first, and dilate the pupil. A concave is more convenient than a plane mirror. If the plane mirror is used, it is to be remembered that the image will move against the mirror in myopia and with it in hypermetropia, and the reverse with a concave mirror.

Dr. Burnett, of Washington, D. C., proposed the name scioscopy. He prefers the plane mirror.

Dr. Calhoun, of Atlanta, wished to know if all cases were corrected by this method so that they did not come back dissatisfied.

Mr. Cross, in closing, stated that retinoscopy was a name in general use now, and therefore it was better not to change it. He thought he would continue to use it. It certainly was not dependent on the view of the cornea, and he certainly never should call it keratoscopy.

FRIDAY, SEPTEMBER 9TH—FIFTH DAY—MORNING SESSION.

The Section being called to order, Mr. H. Power presented a new pattern of *ophthalmoscope, folding handle*, for vest-pocket

use, which could be carried in a case much like a pair of eye-glasses. A paper was also mentioned as having been sent by Dr. David Prince, of Jacksonville, Ill., *On some Points in the Treatment of Dacryocystitis and Affections of the Nasal Duct*, with a new cannula for drainage, which instrument was exhibited to the Section. Dr. E. Smith, of Detroit, Mich., then read a paper on

THE TREATMENT OF ABSCESSES AND ULCERATIONS OF THE
CORNEA WITH JEQUIRITY.

He remarked upon the experience, common to all, of the difficulty in procuring the absorption of pus in the cornea, and noted the existence of the same tendency in all closed abscesses. The best means of arresting suppuration and of getting rid of the pus when formed has engaged the attention of the writer, with many others, for years. A paper on the above subject, in the spring of 1883, with another published in October, 1883, gave the result of his observations up to that time. He had since had many cases of ulceration of the cornea speedily relieved, and an astonishing clearing up of the cornea after its use. He believes the remedy affects the proliferation in corneal corpuscles. After explaining his impression of the mode of action of the remedy, he proceeded to describe his manner of using it. He does not use a strong preparation, and aims not to produce a sharp inflammation, as is done in trachoma. He uses a three per cent. solution, or a very minute quantity of the powdered seed. It is applied sparingly, till a mild catarrhal inflammation is set up, characteristic of the remedy, and in some cases there may be a slight membrane. The object is to avoid a high degree of reaction. The eye is kept washed out with a two per cent. solution of boric acid, and the result is almost uniformly surprisingly good. The corneal cicatrix is often hardly apparent to anyone but the patient.

Dr. Galezowski, of Paris, France, did not like jequirity. In his observation it had frequently produced ulceration and de-

struction of the cornea and synechia anterior, and in some cases enucleation had to be made to avoid sympathetic trouble. He thought jequirity exerted a very bad action on the cornea. The modification in Dr. Smith's method is doubtless in the amount of the drug used. Dr. Galezowski thought it a dangerous method.

In intermittent fever he had found ulceration of the cornea, which yielded to the administration of quinine. In another case, lasting for several months, after the extraction of a tooth, cicatrization occurred. The best treatment for corneal abscess and ulcer is the antiseptic method. He applies the powdered iodoform directly to the surface three times a day under cocaine, and uses the steam douche two or three times a day, ten minutes at a time. When it is not doing well cauterization with a solution of nitrate of silver, twenty-five centigrammes to ten grammes, may be done one or two times every day.

Dr. Richey, of Washington, D. C., wished to know whether scraping the ulcer before applying the remedy had not been found of advantage.

Dr. Smith said that Dr. Galezowski had probably used jequirity in trachoma, in the way described by DeWecker, till he obtained marked diphtheritic membrane. In these cases it was the swelling and chemosis that caused strangulation and loss of cornea. He should hesitate to use jequirity in sthenic cases; it was the asthenic cases requiring stimulation that were suitable for this treatment.

Dr. D. S. Reynolds, of Louisville, Ky., read the next paper on the

NECESSITY FOR REFORM IN THE MANNER OF DESIGNATING LENSES.

He said that often the difficulty was more in the defective apparatus than in the methods employed. The method which he employed was to abandon the idea of measuring and denoting lenses by their focal distance, and make the radius of

curvature the measure of the lens, having them measured from a unit of ninety degrees, or the quadrant of a circle. The lenses might be graded at intervals of five or ten minutes, and in the higher grades have an interval of fifteen minutes. He gave a description of an instrument of Professor Snellen's for determining the value of a lens. It consists of a stand, on which a horizontal beam carries at one end a lamp, and near it a positive lens of one-sixth. In the centre of the beam is placed a clamp for holding the lens to be tested. On each side of the centre, on the beam, is placed a lens plano-convex one-twelfth. Near the lamp is placed a copper disk, perforated by two lines of minute holes, one line perpendicular and the other horizontal. At the farther end of the beam, working in a graduated brass plate, is a frosted glass disk. Steel tapes pass up through the stand and along the beam, connecting with the frosted disk and the perforated plate. It is easy by this means to note the exact point where the point of light reaches the frosted disk without any red or colored margin, and by revolving the lens on trial in the clamp, any irregularity can be easily ascertained.

Dr. Landolt, of Paris, wished to know how the essayist would express in writing the power of the glass by his proposed method. In reply, Dr. Reynolds wrote the prescription for a supposed case on the black-board :

$$\begin{array}{ccc} \text{O. D.} & & \text{O. S.} \quad \text{Bis C.} \\ +\frac{1}{20}\text{C. } 90^{\circ} \mid \subset +\frac{1}{40}\text{S.} \mid +\frac{1}{60}\text{C. } 75^{\circ} \mid \subset +\frac{1}{60}\text{S.} \mid 2\frac{1}{2}^{\text{H}} \end{array}$$

Mr. J. Richardson Cross, of Bristol, Eng., wanted to know the focal length of the unit of Dr. Reynolds' system, and received the reply that it would be something less than an inch.

Dr. Landolt suggested that the radius of curvature, while most accurate as a unit of measurement, is not satisfactory, as with the same radius there may be differences in composition and differences in the refractive power. The manufacturers' lenses will tell you that the refracting index of lenses is a variable quantity, and no one can make lenses, even of the same mate-

rial, that will always have an exactly similar refracting index.

Dr. Burnett, of Washington, D. C., thought we could not get along without a knowledge of the focal distance of the lens. His objections to the proposed change were that Dr. Reynolds' plan lacks simplicity, and that the present method seems to answer the purpose very well and is universally adopted; and that the change would be very difficult to make.

Mr. Cross thought that the proposed plan was based on scientific accuracy. But, as a reformer, the author must not expect to succeed until he can give us a medium which is as accurate as his quadrant. The speaker himself was perfectly content with the accuracy of the metre. Of course it is not quite accurate, but much more so than any other measurement we have. Then all refraction deals with focal length. Our patients want to see at a certain distance. We fit them with glasses to see to a particular point. Again, contrast the simplicity of the metre with the complicated formula of Dr. Reynolds. It is as bad as going back to the inch-system.

Dr. Allen, of Pittsburg, Pa., was unwilling to return to the old system of numerals in refraction. We deal constantly with distance, and distance is measured on a straight line. He thought the adoption of the method would be a step backward.

Dr. Thompson, of Indianapolis, Ind., thought we could not always make scientific methods practicable. He was well enough satisfied to write in the metric system. There was no certainty in the composition of spectacle lenses, even in pebbles, of which so much was talked about all over the country, and so few sold.

Dr. E. Jackson, of Philadelphia, Pa., then read a paper on

THE DESIGNATION OF PRISMS BY THE MINIMUM DEVIATION
INSTEAD OF BY THE REFRACTION-ANGLE.

The object of the paper was to urge the advisability of extending the same principle to the numbering of prisms that now obtains in relation to lenses. The refracting power of the

prism depends upon the substance of which it is composed, and upon the medium in which it is placed. The latter being air, can be eliminated in practice. The same difference existing in the material of which prisms are made as in that of spherical and other lenses, it follows that prisms cut to the same angle may differ very much in the extent to which the ray is bent in passing through them. For instance, a prism marked 3° may have a refracting power of 1.51° or $2\frac{1}{4}^{\circ}$, and yet be the correct one according to the prescription, by our present method of measurement. Among a number of prisms tested only one set came within sixteen per cent. of the supposed standard. He proposed to take as the basis of measurement the minimum deviation or the deflection of the ray when it passed through parallel in the prism to the base, or where the angles made with the surface on entering and leaving were the same. The change could be easily made without producing confusion with the present system by marking the number of the new system inside a circle.

Dr. Landolt, of Paris, expressed himself as much interested in the paper. It was exceedingly meritorious, logical and practical, and he would regard it as an honor to carry out the proposal to support the idea. He moved that the Section take up and support the opinion expressed in the paper.

Dr. Reynolds seconded the motion.

Mr. Power, of London, England, moved that a committee be appointed by the Chair to take charge of the subject, and to report at the next Congress. Carried unanimously.

Dr. G. S. Norton, of New York, read a paper on the

RELATIVE IMPORTANCE OF SMALL DEGREES OF ASTIGMATISM AS A CAUSE OF HEADACHE AND ASTHENOPIA.

He related a number of cases which had occurred to him, where correction of astigmatism of only 0.25 D caused relief to follow with remarkable rapidity. His conclusion was that 0.25 D. of astigmatism may, and not unfrequently does, produce disturbance which its correction relieves. It most com-

monly occurs in children and young girls that small degrees occasion disturbance and asthenopia. If the hyperopia is of high degree, it is better to try to correct the trouble with spherical glasses first.

Dr. F. B. Tiffany, of Kansas City, Mo., next read a paper, under the title of

AMETROPIA,

introducing a series of statistical tables based on examination of over two thousand school-children in Kansas City, including three races—white, red and black. The object of each examination was to ascertain the condition of the eyes, nature of the affection, and endeavor, if possible, to remedy it. The examination took in hypermetropia, astigmatism, and spasm of accommodation, as well as myopia.

The matters of light and ventilation were so well arranged that they might be eliminated as factors in the result. It appeared as if the greater number of ametropes in proportion were in the higher classes, and it might be said that ametropes were more fond of study than emmetropes. Spasm of accommodation developed into myopia. If the eyes were examined each year and corrected carefully, the anomalies would gradually diminish. Hazel eyes are most affected by myopia; blue and gray stronger than hazel, brown and black. Females have more myopia than males, and Indians are mostly emmetropic.

Dr. Burnett, of Washington, D. C., remarked that he suspected that in the prompt relief spoken of by Dr. Norton the astigmatism was between 0.25 D. and 0.5 D. He found that when one of these cases did so well with 0.25 D., the total amount was somewhat greater.

Dr. Herbert, of Philadelphia, has been astonished to find how little annoyance is felt in high degrees of ametropia and astigmatism, and how much from slight degrees. He had had not infrequently to prescribe as low as 0.2 D.

Dr. Tilley, of Chicago, remarked on Dr. Tiffany's paper that every new born child is hypermetropic. Myopia does not generally occur till six or seven years of age.

Dr. Young, of Iowa, remarked that the astigmatic glass determined under atropia was not always accepted. The ciliary muscle did not always readily change its compensatory contraction, and a cure by cylinders was sometimes worse than the disease.

Dr. Dickinson, of New York, related a case of reflex irritation, with nausea, etc., existing three years, which had been promptly relieved by correction of a very low-power cylinder.

Dr. Baldwin, of Montgomery, Ala. wished to state, as to the condition of the negro in regard to refractive troubles, that in over nine hundred cases he had only found an error of refraction in about eight per cent. This seems to bear out the old doctrine that civilization increases eye troubles.

Dr. Calhoun, of Atlanta, Ga., stated that it had been his experience that the negro had very little refractive trouble, and, if they have not been to school, none whatever. He had known of but one near-sighted negro up to ten or fifteen years ago. Now myopia is becoming more frequent. They are subject to other eye troubles, specific affections of the cornea and other parts, but they do not seem to be so serious as in the white, and get well very easily, with almost no treatment at all. Another thing, glaucoma is of extremely uncommon occurrence among them. He had only seen three cases among negroes.

Dr. Burnett, of Washington, D., could corroborate what Drs. Baldwin and Calhoun had said concerning the increase of myopia in the negro of late years, and desired also to call attention to the fact that the negro does not squint. He thought that glaucoma occurred in the negro, although, perhaps, not to the same extent.

Dr. Blitz, of Minneapolis, Minn., wished to add his testimony to what had already been said about refractive errors and squint in the negro. He finds disease more easily handled in the negro than in the white.

Dr. Galezowski, of Paris, said that in many cases asthenopia was caused by small degrees of astigmatism, but in many others this had not the effect. He instanced the case of a student, an American, who suffered great inconvenience when

using his eyes. Professor Hirschberg, of Berlin, found a slight degree of astigmatism, and corrected it, which relieved the patient for two weeks, and then he became worse again. He came to Paris, and under Dr. Galezowski's notice, who suspected that it was not the ametropia that was causing the trouble. Examination disclosed tenderness over the supra-orbital notch, over the right eye, and all around the left eye. He suspected trouble with the teeth, and found one that had been plugged, but was not tender. He had the plug taken out, and found a small piece of rubber crowded up through the top of the tooth. The tooth was extracted, and the patient recovered. These cases are not infrequent. In other cases it may be a slight alteration in the lachrymal punctum. To test the matter, Dr. Galezowski injects tepid water, and if it enters the nose badly, it is treated by daily injections and dilatation of the canal, not catheterization.

Dr. Reynolds, of Louisville, Ky., remarked upon the difficulty of having the patient wear glasses properly, especially in people who were not in the habit of wearing them. In some cases the distance between the eyes has to be so nicely adjusted that the patient must have a pair for distance a little wider apart, and a pair for near work closer together.

Dr. Gradle, of Chicago, found very few of his cases of asthenopia relieved by weak cylinders.

Dr. Leartus Connor, of Detroit, Mich., does not recollect that he has had occasion to use as little as 0.25 D.

The president referred to his own experience as corroborating the remarks of the previous speakers in relation to errors of refraction in the negro.

Dr. E. Smith, of Detroit, Mich., found a great amount of refractive error among negroes, and said that it was not uncommon for him to operate upon them for strabismus. It may not be so in the pure negro. In his section they are considerably mixed.

Dr. Erwin, of Ohio, stated that as oculist to the Pennsylvania Railroad Company, he had found that about twenty-five per cent of the men employed in the transportation service are

astigmatic, and yet not more than twenty per cent of those referred for special examination have astigmatism. None of the twenty per cent complained of vision, except referred for spectacles, and only ten per cent of those so referred required correction of astigmatism to relieve suffering.

Dr. Norton, in closing the discussion, said that he had not advanced the subject as anything new. He agreed with Professor Galezowski that many other causes might produce asthenopia and neuralgic symptoms. As to the exact determination of the amount of astigmatism, he used two sets of radiating lines, one coarser than the other, and when the patient was able to see all the lines in the finer diagram he was quite sure to be accurately corrected.

In rising to adjourn the Section the president, in a few well-chosen words, thanked the members for bearing with him and so cordially supporting his endeavors, and expressed the hope that it had been a season of pleasure and profit to all. There was no doubt about its having been a success.

Mr. Power, of London, England, moved a vote of thanks to the president for his agreeable way of conducting the meetings, and thanked the Section and the profession for the very pleasant time enjoyed.

Dr. Landolt, of Paris, France, wished to warmly support Mr. Power's motion. To the good help of their American brethren, as well as the untiring energy of the president, the success of the meeting was due.

Dr. Galezowski, of Paris, France, also expressed his pleasure and thanks in a few well-chosen words. The Section then adjourned *sine die*.

After adjournment Mr. J. Richardson Cross, of Bristol, England, gave a demonstration of the method of

RETINOSCOPY,

as used by him with Doyne's optometer.

CORRESPONDENCE.

"PATHOGENESIS OF PTERYGIUM."

EDITOR.—In Dr. Theobald's suggestion regarding the pathogenesis of pterygium published in the August number of your journal, I have to confess to a feeling of disappointment. To my mind it is much easier to account for the origin of the growth and its common location over the internal recti muscles, than to account for the peculiarities of the growth when once established—its trowel-like shape, overlapping edges, and disposition to march regularly to the centre of the cornea.

That there is sufficient justification for the teaching that "development of pterygium is favored by conditions which produce persistent hyperæmia of the conjunctiva" is manifested in the fact that it is most commonly found in sea-faring people, stokers, foundrymen and farmers, particularly those on the high prairies of the West and Northwest. In their everyday work these people (the farmers more perhaps than any other class, and with them it is most common) experience "persistent hyperæmia of the conjunctiva" from the forcible and continued impact of such irritants as strong winds, glaring light, scorching heat and clouds of dust. Their work is varied, too, in character, but the exposure is practically the same and the results are identical. It would be strange, indeed, if the surroundings were not intimately connected with the result, and I believe that the further the matter is investigated, the more conclusive will it be, that there is a most intimate connection—in short that the continued exposure to irritant winds, heat and dust is the principal causation of pterygium.

As to the location of the growth, there is good reason in this view why it should be found so uniformly over the internal

recti muscles. To shut an eye to irritants and yet keep it open sufficiently to see any work ahead the orbicularis necessarily contracts irregularly. Extremely to the temporal side, moderately through the rest of its course. The result is that in the great majority of people the eye is well protected except over the centre of the cornea and a small strip to the nasal side of the cornea. If it is attempted to cover this strip it will usually be found that the cornea has also been covered sufficiently to materially interfere with the use of the eye. With a mirror anyone can demonstrate this for himself. In short, again, if exposure produces the growth what more natural than that it should be on the part most exposed? And this is directly over the internal recti muscles.

That pterygium is occasionally due to other causes I have no doubt. It has been demonstrated that it can come from a marginal ulcer. But if want of harmony between convergence and accommodation is of itself a potent factor in the causation, it should be prevalent among book-keepers, students and house-workers generally. These people, however, seem to have a wonderful immunity from it. While on the other hand, the people who live out of doors and have the minimum exercise of convergence and accommodation are its victims.

H. B. Young, M.D

Burlington, Iowa.

GLEDITSCHINE.

The following letter was received and we publish it here for the benefit of our readers. Although we withhold the name of our correspondent, their testimony is absolutely reliable. It explains itself.

DEAR SIR:—We are in receipt of your valued favor of the 25th inst. and in reply would say that our investigation of "*gleditschia triacanthos*" has proved it to be worthless, and such being the case, we do not think it worthy of your attention.

When the alkaloid was spoken of some time ago by physicians we immediately procured a 2 per cent. solution of it for investigations, being unable to obtain the alkaloid itself, and analysis of it by our chemists proved it to contain 6 per cent. of cocaine with a trace of what we are led to believe is atropine, thus showing conclusively that the alkaloid (?) itself is a humbug. Upon the report of certain physicians we made tests of the alkaloid, and finding it to possess anæsthetic properties we were induced to prepare the fluid extract which was spoken of in the medical journals. The alleged alkaloid, however, proving worthless, of course, the fluid extract would not possess any great medicinal properties.

We are always on the alert, either to introduce to the medical profession valuable new therapeutic agents, or to expose such humbugs as these when they are palmed off on them by unscrupulous persons.

Awaiting the pleasure of your further commands when we can serve you, and assuring you of our desire to do so, we remain, very truly your friends.

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GLEDITSCHINE, SPURIOUS AND GENUINE.¹

BY EDWARD JACKSON, M. D., PHILADELPHIA, PA.

In publishing my observations on the action of the so-called stenocarpine (in *The Medical News* of Sept. 3, 1887), I stated :

"In studying the action of this drug, one cannot but be struck with its similiarity to that of cocaine. * * * This similarity of action raised in my mind the question, whether this new drug possessed any power which would not be possessed by a solution of cocaine to which had been added a portion of one of the stronger mydriatics, as duboisine or hyoscyamine."

It seemed to me then, however, that the drug did "possess certain powers, in degree at least, peculiar to it. My impression is that the solution used, said to be a two per cent. solution is a more powerful anæsthetic than the four per cent. solution of cocaine."

I also thought that while its influence over the accommodation was more powerful than that of homatropine, that the recovery of the accommodation from its effects was more rapid than from any previously known mydriatic, except homatropine.

In this last respect I soon found I had been in error. A few

¹Read before the Philadelphia County Medical Society

days after that paper was published I came across the records of some experiments which I had made nearly six years ago, and some of the results of which I reported in a paper read before the Medical Society of the State of Pennsylvania in 1882; and among them some trials of weak solutions (1 to 1000 and 1 to 2000) of duboisine and hyoscyamine in my own eyes, where the recovery corresponded exactly to the recovery observed after the use of the alleged new drug. This discovery redoubled my suspicions. I then took twenty-five grains of the solution, dried it over sulphuric acid, and weighed the residue, which I gave to Dr. Henry Leffmann, who dried it still further, and weighed it again; its weight, as reported by him, was 1.62 grains. This demonstrated that the so-called two per cent. solution of "stenocarpine" was not what it purported to be.

In my paper, before referred to, I objected to the name stenocarpine as probably not indicating the real source of the drug, and pointed out that Mr. Goodman's description of the tear blanket tree corresponded with that of the *Gleditschia triacanthos*, or honey locust; and stated that "extracts made from the leaves of the honey locust growing near Philadelphia failed to exhibit any anæsthetic or mydriatic properties." About the same time I wrote to Mr. Goodman asking for specimens of the leaves: and he promised them, but they have not yet been received. Soon after this, however, I obtained specimens of leaves from Jefferson County, Texas, which were pronounced those of the honey locust by Dr. J. T. Rothrock, Prof. of Botany in the University of Pennsylvania, who had been the first to suggest to me that the honey locust might be the tree described. These leaves proved as inert as those obtained in this vicinity.

Shortly after this Dr. J. H. Claiborne published in the *Medical Record* of Oct. 1, 1887, a detailed and illustrated account of the honey locust; stating that Mr. Goodman and Dr. Seward had fully identified it as the source of the new local anæsthetic, and proposing, therefore, to call the "new" alkaloid Gleditschine. The publication of the above facts indicating

the fraudulent character of the "stenocarpine" solution was delayed until some of the genuine Gleditschine could be studied. But, simultaneously, Mr. F. A. Thompson, in the *Medical Age* of Oct. 25, and Dr. John Marshall, in *The Medical News* of Oct. 29, published analyses of the alleged stenocarpine—Gleditschine solution, by which the fraud was fully exposed. They proved that unquestionably the solution contained cocaine and a member of the atropine group. The latter is not, however, atropine itself, as might be inferred from their papers; but on account of the brevity of the paralysis of accommodation it produces, must be, I think, hyoscyamine, duboisine, or daturine.

When talking with Dr. Henry Leffmann about the *Gleditschia triacanthos*, he told me that he thought that it had been the subject of investigation by the late Dr. B. F. Lautenbach, who had published something about it in the *Philadelphia Medical Times*. On looking into the matter, I found that in the issue of that journal for November 23, 1878, just nine years ago to-day, Dr. Lautenbach had published a brief communication entitled "Gleditschine—A New Alkaloid," with the promise that "in a later publication this subject will be treated of more fully. The promise remained unfulfilled, doubtless on account of the early death of this talented, original investigator. But the brief preliminary contribution is of that substantial character which always, sooner or later, proves its value. I make from it the following extracts:

"When, however, an alcoholic extract of the unripe seeds and the portions of the fruit immediately surrounding these (the remainder of the unripe fruit is practically inert) was used, very active poisonous effects were observed. In from five to twenty minutes the frogs were in a profound state of stupor. No reflex movements could be excited by any of the known means, though at that time the motor nerves still remained irritable. This loss of reflex activity was not due to loss of function of the sensory nerves through the direct action of the poison on these structures, as, after ligature of all the blood vessels of a limb, irritation of that limb failed to produce re-

flex movements when the animal was poisoned with the extract. The heart continued to beat for hours after these symptoms appeared. If a not too large dose was given, the animals recovered after being in this state for twenty-four hours." * * * "To isolate the active principle the portions of the fruit used were digested in absolute alcohol and ether, then precipitated with lime, and the alkaline filtrate neutralized with dilute sulphuric acid. The dense precipitate thus obtained was allowed to crystallize. The crystals were dissolved in water, and the alkaloid precipitated by lime." * *

"The crystals which were obtained were elongated rhombs, almost completely insoluble in water, but readily soluble in alcohol. They leave no ash when heated on platinum. The alcoholic solution is alkaline, and with dilute sulphuric acid gives a dense white precipitate. * * * composed of elongated rhombic crystals, whose angle, however, was much smaller than that of the Gleditschine crystals. Both the original crystals and the sulphate produced in frogs and toads the symptoms before described."

"Gleditschin, as I propose to call this new alkaloid, forms salts with sulphuric, nitric, hydrochloric, acetic, and tannic acids. All these salts crystallize in modifications of the rhomb," * * * "The first symptom produced in frogs is a state analogous to sleep. Following this rapid abolition of reflex activity takes place, and respiration ceases. The galvanic irritability of the nerves is much diminished."

After reading this account by Dr. Lautenbach of the substance clearly entitled to the name Gleditschine, I endeavored to obtain some of the unripe fruit, in which, according to Dr. Lautenbach, the drug is to be found. With some difficulty and after considerable delay, a peck of the fruit was obtained, but the pods and seeds were most of them very nearly mature. However, Mr. James A. Kyner, Demonstrator of Chemistry in the Polyclinic, following in the main the method of Dr. Lautenbach, obtained from them a very small amount of a solution of what we believe to be the sulphate of the true Gleditschine. On evaporation it deposits crystals of a narrow rhombic form.

When ammonia is added it gives a precipitate, which presently crystallizes in broader rhombs. On the frog it produced the symptoms narrated by Dr. Lautenbach, though my supply of the solution gave out before the stupor was complete. The symptoms reached their height in fifteen minutes after the hypodermic injection of the solution, were passing off in an hour, and had disappeared entirely in less than three hours. *This solution freely applied to the conjunctiva produced no anæsthesia, or dilatation of the pupil, whatever.*

The analyses and tests above referred to, with several others that have since been published, have pretty well disposed of the alleged new local anæsthetic and mydriatic; and Gleditschine has lost its interest for the ophthalmic surgeon. But the incident, disagreeable as its ending may have been to some of us, is not without its useful lessons.

First. It is shown that such a fraud cannot be carried far even with a drug as difficult of positive chemical identification as cocaine. And every such attempt at fraud can only make more brief the period, and decrease the profit, of succeeding attempts.

Second. It has been demonstrated that cocaine can produce anæsthesia through the unbroken skin; although, as I have pointed out (*loc. cit.*), this is extremely superficial; and "To make a painless incision in tissues anæsthetized in this way, one must do it by repeated superficial cuts with the knife, keeping all the time the cut surface bathed with the solution."

Third. Attention has been drawn to the *Gleditschia triacanthos*, and the genuine Gleditschine discovered and studied nine years ago by Dr. Lautenbach, but recently in a fair way to be forgotten. And in the direction of a further study of this substance lies the probable path of profitable future investigation. The leaves have been proven practically inert, and for several months it may be impossible to obtain specimens of the unripe fruit. But other parts of the plant might be tested for it. In the *Medical Age* of November 10, Dr. Crull states that he has cured gleet with a decoction of the bark of the root of the thorny honey locust (the more common variety), and that

taking a tablespoonful of the decoction himself "caused nausea, giddiness, dimness of sight, cold perspiration, and a prickly or smarting sensation of the tongue and throat. These symptoms continued for nearly three hours, when they gradually abated. The evacuation of the bowels the following morning was very bilious and watery."

A CASE OF OPTICO-CILIARY NEUROTOMY.

BY D. COGGIN, M. D., SALEM, MASS.

On April 5, 1879, I was consulted by Mrs. Margaret M., æt. 57, Ireland, Housewife, Salem. She had lost sight in the left eye nineteen years ago. I had seen her as an out-patient last November. She then presented symptoms of irido-cyclitis, *viz.*, ciliary redness, much pain and tenderness. T+2. Occlusion of pupil. Iris, *bombée*. No perception of light. Right eye V.=fingers at 5', with photophobia and lachrymation.

Enucleation was then and subsequently positively declined, but consenting to a neurotomy, she was admitted into the Salem Hospital. Under ether the external rectus was divided (in place of the internal, as marked convergence was present).

A ligature was passed through the tendon, as in the operation for advancement. The optic nerve was severed, the speculum withdrawn and pressure applied on the eye-ball through the closed lids for a few minutes, which rendered the hæmorrhage insignificant. The scissors were again introduced and the ciliary nerves cut through, when the eye was so greatly protruded by the gush of blood into the orbit as to make it doubtful if enucleation could be avoided. The severed ends of the external rectus, with the conjunctiva, were brought together, the internal rectus was cut and a pressure bandage was then applied.

April 6. Cornea anæsthetic. Patient comfortable. No chemosis, but an extensive ecchymosis, the blood involving the cellular tissue around both eyes and hanging like a bag beneath the left cheek. Globe still very prominent.

Blood in front of occluded pupil; none gravitated to floor of anterior chamber. No constitutional disturbance, nor was there any later. Patient discharged on May 2; the exoph-

thalmus was now gone. A little blood at the bottom of the anterior chamber. She says the eye is tender inferiorly. No photophobia now in the right eye.

In November the patient was in the hospital owing to a bronchitis. The eye was then quiet and anæsthetic.

Aug. 4, 1882. Patient states that the left eye is tender on pressure (?) T. diminished.

June 22, 1883. At times "severe pain" in left eye. Is conscious when the eye is touched with a probe, but the sensation is not painful. Eye-ball undergoing atrophy.

October, 1887. Cornea clear. Atrophy of iris below, T—. No pain complained of on pressing against cornea with a probe. No redness, and no discomfort in the eye. The right eye is apparently normal. Thus it appears that the relief following the neurotomy, eight and one-half years ago, has continued to the present time.

THE BICHLORIDE OF MERCURY IN THE TREATMENT OF EXTERNAL DISEASES OF THE EYE.

BY ADOLF ALT, M. D., ST. LOUIS.

Starting from the theoretical standpoint that disease is probably in most cases caused by the action of a living *materia peccans* upon the tissues of the human body, and that such a living *materia peccans* will be more readily found to act on the parts continually exposed to the air, oculists in common with general surgeons have for years adopted antiseptic and aseptic measures. The probability that all diseases of the conjunctiva and lids are due to the action of microbes is very great. Numerous pathogenic (and, as far as known, non-pathogenic) microbes may be found even in the healthy conjunctival sac. In common with others I have, therefore, for a prolonged period tried to find out which of the many germicides now in use and generally approved would be the most suitable in the treatment of the diseases of the lids and conjunctiva. To be sure, many of the remedies in use in ophthalmic practice before the antiseptic period virtually belong to the germicides, and their beneficial action may now be safely attributed to such qualities. Without going any further into this question I want to state that carbolic acid, iodoform, iodol and boracic acid have all in turn been carefully tried by me, and that the results in my experience have not been altogether satisfactory. The remedy which I consider by far superior to those just mentioned, is the bichloride of mercury. The strength in which I have been in the habit of using it for over a year varies from one part in 2500 to 1 part in 5,000 (or even in 10,000 in children). Sometimes I found that in cases in which I wanted to use the first named solution, I had to dilute it on account of the severe pain it caused. It is a strange fact

that, while most people declare the instillation of a 1 in 2500 solution produces no more disagreeable feeling than a drop of water would cause, others (luckily but few) complain of an excruciating pain following directly upon the instillation. In these latter cases even a weaker solution is usually rather painful. The following synopsis of affections in which I have tried the bichloride of mercury and the results obtained will, perhaps, prove of some value to others.

I direct the patients in all cases to have the solution *poured* into the eyes while they are in the recumbent position, and in such a quantity, that it is sure to reach all the parts of the conjunctival sac. This may be aided by manipulating the upper lids.

In *simple conjunctivitis* with hardly any discharge, but heat and dryness of the lids, especially in the evenings, where boracic acid seems to be useless, instillations of the bichloride of mercury solution morning and evening seem to act well without exception.

In *acute catarrhal conjunctivitis*, in which I thought the relief should be easily obtained by the germicide, my general experience has been that its use alone, even when frequently instilled, was not altogether satisfactory. Yet I think it a decided help in the treatment of these cases as an adjunct to the nitrate of silver and ice.

In *chronic catarrhal conjunctivitis* its action is very agreeable to most patients, and often no other remedy need be applied.

In *phlyctenular conjunctivitis* it seems, strange to say, to have a bad influence, and I no longer use it. Calomel and the yellow oxide of mercury are decidedly superior in their action on this disease.

In all *purulent* forms of conjunctivitis including the gonorrheal ones of the new-born and adult, the frequent irrigation of the conjunctival sac with a 1 in 2500 solution of the bichloride of mercury seems, in my experience, to be without a rival. Although in some very severe cases I have thought best to apply the nitrate of silver for some days aside from the subli-

mate instillations, I have in many cases used nothing but the sublimate solution. The latter I had freely poured into the eyes every half hour, having besides iced compresses applied day and night. The results have been very satisfactory. No ulceration of the cornea has so far occurred in my practice under this treatment, even in dispensary practice, when the case was seen early enough.

The same excellent result (see AM. JOUR. OF OPHTHALMOLOGY, Vol. IV, page 44) I have obtained in these cases of *diphtheria* of the conjunctiva. The number of cases is, however, too small to take it upon one to advise his colleagues to simply rely on this experience.

In the treatment of *trachoma*, especially of recent cases, I consider the instillation of the sublimate solution, morning and night, of a great help, and I always order it to be so used.

In *blepharitis ciliaris* the instillation is also of value; yet, more on account of the conjunctivitis accompanying the blepharitis. However, the application of cotton soaked in the sublimate solution during the night seems to act very beneficially.

During the last few months an item is going through the medical journals recommending on what seems good authority the use of boracic acid in *hordeolum*. I must say, this recommendation astonished me, since I had thoroughly tried this remedy at least as a prophylactic measure after having opened a hordeolum, and had failed to see any benefit from it. I must, however, state almost the same of the prophylactic qualities of sublimate in this affection, as I have in several cases seen new styes being formed while the instillations of a sublimate solution were used. In other cases none but the original stye were formed; yet, the same experience is often made, where no prophylactic remedy is used.

In *parenchymatous keratitis*, caused by inherited syphilis, the instillations of a sublimate solution do not seem to have any beneficial influence. The cases in which I tried it are, however, as yet, not numerous enough to give a final opinion.

Ulcers of the cornea seem to do better when freely irrigated

with the bichloride of mercury solution, especially after cauterization with pure carbolic acid. Iodoform, so highly recommended by others, has never given me any satisfactory results.

In cases of *dakryo-cystitis* or *dakryo cysto-blennorrhœa*, my experience with the bichloride has also been a very satisfactory one.

A CASE OF UN-PIGMENTED SARCOMA OF THE CILIARY BODY AND IRIS.

BY ADOLF ALT, M.D.

Mrs. S., 29 years of age, consulted me for the first time on June 15th of the present year, with the following history: About four years previously she suffered from pain in the left eye and loss of vision. After several weeks of suffering she consulted an oculist, who, as she insists, told her that she was suffering from an affection of the optic nerve which necessitated an operation to save the fellow-eye. From the description she gives, he meant optico-ciliary neurotomy. The eye, however, got better without further treatment. About a year after, a similar attack of pain and dimness of vision occurred, which yielded to treatment, and from her description was an iritis, as probably the first attack had been. She was again comfortable for about a year after this, when another attack came on. Since then this (left) eye has been virtually continually inflamed, the treatment she was under giving her at times comfort, at times being useless.

When first I saw her she counted fingers at 2 feet. There was considerable lachrymation and photophobia, and continued excessive pain. The conjunctiva showed atropine granulations. The eyeball was deeply injected, the iris discolored, the pupil small and irregular, filled with an iritic membrane and bound down to the lens, but pushed forward to some extent into the anterior chamber. In the angle of the iris at about the middle of the lower quadrant there was a very min-

ute dark spot, just raised above the level of the surrounding tissue. Although no specific history could be made out, yet I took this tumor for a beginning gumma and at once instituted vigorous anti-syphilitic treatment. With antipyrine internally she had at least some rest. Under this treatment the inflammatory symptoms subsided, yet, what I had thought to be a gumma remained apparently unchanged. This apparent improvement lasted until July 27th (about 6 weeks) when a new inflammatory attack set in with terrible pain and increased intra-ocular pressure. I now advised an iridectomy in order to counteract the effects of the occlusion of the pupil and to remove, if possible, at the same time the suspicious little raised spot in the iris. To this the patient consented only after another ten days of terrible suffering. On the 10th of August I made an iridectomy downwards, but found it impossible to remove the little tumor owing to its peripheral position. The result of this operation was an immediate cessation of the pain and comparative comfort for a short period. Then the same old story came on again, and with the new attack of inflammation the artificial pupil closed up again. The pain was terrible and yielded to nothing. The little spot in the iris-angle was evidently growing and now protruded far enough into the anterior chamber to be seen above the corneo-scleral margin. I now advised the removal of the eyeball, believing it certain that I had to deal with a sarcoma of the iris. Upon this advice the patient disappeared for some time. On October 22nd she returned to my office, very much in the same condition, only there was now a distinct tumor of about the size of a pin's head. She confessed having seen two other colleagues and remained under their treatment, since they had promised to cure the eye without any further operation. This they had failed to succeed in and, when at the last visit she had asked them whether they could do nothing else for her, but what they had done, she had received the answer that the only thing remaining was to remove the eyeball. Even now she consented only to have the eye removed, when I told her that this was the only condition on which I would have anything further

to do with her. On October 24th I removed the eyeball with the assistance of Dr. A. C. Robinson of this city. The healing was uninterrupted. The pain and agony have, of course, disappeared.

After the eyeball had been well hardened and cut in two, I found that the tumor of the iris was in connection with a larger one in the ciliary body upon which it sat like the nipple on the breast. The nature of the tumor was that of an unpigmented spindle-cell sarcoma. The optic nerve was slightly cupped.

From the relation of the tumor in the iris to the original one in the ciliary body, it became clear why, in making the iridectomy, I could not succeed in removing it. The histological character of the new formation corresponds with its slow growth. I am, however, not prepared to state that the first inflammatory attack four years ago marked the beginning of the growth of this new-formation.

TRANSLATION.

In the *Archiv f. Gynæcologie* we find a very interesting article written by Dr. Ludwig Korn "On the Prevention of the Blenorrhœa of the Newly-Born." From this paper we make the following extracts: After having given a careful consideration to the method of Crédé, that is the instillation of a two percent. solution of nitrate of silver into the conjunctival sac of the newly-born, the author details at length the experience gained at the Dresden Clinic for Women with Kaltenbach's method, of disinfecting the vagina of the mother with a solution of bichloride of mercury and washing the baby's eyes simply with distilled water. While with this latter method in 3 per cent. of the children a blenorrhœa was observed, he states that under the use of Crédé's method no case of blenorrhœa of the newly-born occurred in 1,600 cases of confinement. The author says: "These figures prove that by means of Crédé's method it is possible to positively prevent an ophthalmoblenorrhœa."

He then goes on to say, that remarks made at the meeting of German naturalists at Muenich by Cohn and Hegar prompted him to make a further series of experiments to solve the question, how best to prevent the blenorrhœa of the newly born.

"The method employed was the following: Every woman in labor was carefully cleansed. When possible, they were put into a warm bath. After the hair on the genital organs had been clipped, the external parts were washed with soap and irrigated with a solution of bichloride of mercury of 1 in 1,000. The vagina was washed out according to Kaltenbach's method with a solution of the bichloride of 1 in 3,000. In every case which appeared to be suspicious of blenorrhœa I rubbed the mucous membrane of the vagina and cervix well

with my finger while the irrigation was made, as Cohn recommended. During parturition these irrigations were repeated several times—before and after every digital examination. As soon as the head was born the eyelids and the portions surrounding the eyes were scrupulously cleansed by means of cotton soaked in simple hydrant-water, and especially all the smegma was removed. We rubbed the cotton from the outer toward the inner canthus, continually using fresh pledgets of cotton until the lids were perfectly clean. We particularly tried to prevent any opening of the eyes before this cleansing by process was finished. In many cases we only succeeded in this pressing the folds of the skin from forehead and cheek towards the eye about to be washed with the thumb and forefinger of the left hand while the washing was done with the right hand.

Then came the problem, how to protect the clean eyes against further contamination. After the child was perfectly born, but before the cord was severed, the whole face and the head of the infant were washed in the way just described. We were thus enabled to disregard these parts altogether when the babe was put into the bath. We soon recognized one of the sources of later contamination in the hands of the babe. I therefore had them held tightly until the whole body was well washed, or I rendered their touching the eyes impossible by wrapping the trunk and extremities in a sheet. After the bath the hands of the baby were again separately washed with soap.

The results were astonishingly good. In one hundred cases no ophthalmo-bleorrhœa was observed.

From this it seemed evident—what Hegar had already stated as his opinion—that very probably the infection of the eyes of the baby does not take place while it passes through the vagina, but that it takes place later, and is, so to speak, artificial, and due to unsatisfactory cleansing. In fact, the eyes of the babe are sufficiently protected to make the entrance of mucus into the conjunctival sac almost impossible. Only a face presentation might favor this accident.

From this reasoning we then abandoned the careful, in our

cases even heightened, prophylactic cleansing of the vagina, and reduced the strength of the sublimate solution to 1 in 4,000. The vagina of every woman in labor was now irrigated with this solution before and after each examination, as had for years been the custom in this institution; the mopping and rubbing of the vagina were totally abandoned. When for some reason no examination was made, no irrigation was made. In such cases we had formerly always used the instillation of a nitrate of silver solution into the baby's conjunctival sacs. Since we had come to suppose that the infection of the eyes does not take place during the passage through the vagina, we could also dispense with the nitrate of silver in these cases. We therefore henceforth simply washed every baby born in this institution in the manner above described with simple hydrant water, without paying any attention to a previous cleansing of the parturient mother. The results remained equally good, as soon as the nurses were well accustomed to the scrupulous compliance with the orders. In the beginning of the series the work was all done by the assistant physician and older nurses, while later on the pupils of the school for nurses did it all.

Up to date we have treated 1,000 babies in the manner described and without *argentum ni ricum*. Four (0.4 per cent.) of these were affected during the first 4 days of their life by ophthalmo-blenorrhœa. The last case can, however, not be attributed to this method. This baby was born while a Cæsarian section was being performed, and all hands were busy, and it was bathed by a nurse who had come to the institution only a few days previously. It need hardly be stated that she was not yet familiar with the necessary procedures. Deducting, therefore, this case, we had 3 cases of ophthalmo-blenorrhœa in 1,000 babies, equaling 0.3 per cent. This result is much better than Cohn's (1.2 per cent.); but we think it can yet be materially improved upon. Let us look at the distribution of these cases: In the series two cases happened among the first 300. In this way only one case of blenorrhœa happened among the 700 remaining cases. In the last 420 births not a single blenorrhœa was observed.

Ninety-six mothers had not been irrigated, most of them even not in any way been externally cleaned. Often the head was being born already when they entered the institute; almost always parturition took place within a quarter of an hour of their admission. All their babies remained well, although some of them had granular vaginitis or other symptoms which indicated a gonorrhœal infection.

These last cases seem to prove as correct almost to a certainty the assumption of Hegar and Cohn, that the baby's eyes are not infected in its passage through the vagina. * * *

* * * What, now, is the value of the method here described?

We have seen that we reached equally good results even when we ceased washing the outer genital organs or disinfecting the vagina. The pupils of the school for nurses were just as successful with this method as when it was applied by the physicians. It is, therefore, simple and can be learned easily. In it no chemicals are needed, neither the bichloride of mercury, nor the nitrate of silver nor any other disinfectant or caustic. All that is required is some clean surgeon's cotton, which may be replaced when necessary by freshly washed clean linen and the ubiquitous clean drinking water. Every nurse or *sage-femme*, having learned this method, can apply it in her private practice, and we are the more certain that no affections of the eyes will take place, since the danger of carrying the infection from one case to the other is removed. The latter point is of grave importance in a lying-in hospital. It now becomes the duty of all lying-in hospitals and nurses' schools to employ this method and to give the pupils an opportunity to see it used and to learn how to use it.

To sum up the results of our experiments, we may formulate them in the following five propositions:

1. Credé's method of preventing ophthalmo-blenorrhœa is absolutely certain and trustworthy when applied in the proper manner.

2. The active part in Credé's method is the nitrate of silver which is a specific against the gonococcus.

3. The infection of the baby's eye with the gonorrhœal poison does not take place in the vagina, but always after birth. Face presentations alone may make an exception to this rule.

4. Simply the most scrupulous cleanliness during birth and the puerperium, especially by the method above detailed, is sufficient to reduce the affections of the eyes to a minimum, and, most probably, it can prevent them altogether.

5. The method is a very simple one and can be learned by every nurse. It should, therefore, especially since no irrigation of the vagina with bichloride of mercury is necessary, be introduced into all nurses' schools."

In *Hirschberg's Centralblatt* we find a report on a work by Dr. M. Borysickiewicz on "Researches Concerning the Finer Structures of the Retina." The summing up of this result seems to us to be important enough to be here reproduced.

A Mueller's fibre begins at the membrana limitans interna and ends as a rod or cone. It is most probable that it passes without offsets through all the layers of the retina. The cells found in these radiating fibres at the height of the inner granular layer are to be considered as inner granules and not as nuclei of the fibres. In the outer granular layer each fibre has only one outer granule in the area of the fovea centralis, outside of it they have sometimes two. The number of outer granules must therefore be larger than that of the rods and cones. It is, however, uncertain whether every fibre contains more than one granule outside of the fovea centralis. The author believes that the outer granules change their positions during life. He even insists upon it, that a rod is changed into a cone by the simple immigration of an outer granule into it.

The author thinks that as the most important point he has proven that the rods and cones are the ends of the radiary fibres and can, therefore, not be of a nervous character. If we, on the other hand, vouchsafe the rods the function of perceiving light, we must grant to the radiary fibres the same faculty.

He further thinks he has proven that the rods and cones can no longer be considered the isolated organs standing by the

side of each other in a regular arrangement, as we have heretofore considered them. By the immigration of granules the ones must be enlarged, the others be pressed aside.

The indirect proofs that the layer of rods and cones contains the light-perceiving organs may just as well be applied to any of the other layers of the retina. This, therefore, forces us to the assumption that the light-perceiving organs must be looked for in the region from the inner granular layer to beyond the outer granular layer, and *within the tubes which are called Mueller's fibres.*

EDITORIAL REMARKS.

The following communication to the *Medical Age* we reproduce here, as the subject is of especial importance to the ophthalmic surgeons. The fraud perpetrated by the "inventors" of this new local anæsthetic is only equaled by the coolness with which a large and well known firm could lend its help to bring the solution into the market, without having previously investigated it. The price charged and received of \$6.00 per ounce, we hope, is not the cause of such an oversight. At any rate, we owe it to Messrs. Parke, Davis & Co. that the fraud has so soon been detected, and we herewith express our sympathy to the colleagues who have been made to suffer by this abominable trick. (See Dr. Jackson's paper in this number).

THE GLEDITSCHINE (STENOCARPINE) SENSATION EXPLODED.

The readers of the *Age* are, doubtless, already familiar with the claims that have been made as to the remarkable anæsthetic and mydriatic properties of an alkaloid said to have been derived from *Gleditschia triacanthos*, and which was at first called stenocarpine (see papers of Drs. J. H. Claiborne, H. Knapp and Edward Jackson, *N. Y. Medical Record*, July 30, Aug. 13, Oct. 1, and *Philadelphia Medical News*, Sept. 3).

While experience with other so-called rivals of cocaine had rendered us rather sceptical as to the validity of the claims made for gleditschine, the glowing reports that had appeared led us to investigate at our laboratory this much vaunted anæsthetic. We accordingly obtained a supply of gleditschia triacanthos, from which we were unable to extract but an infinitesimally small percentage of alkaloid, which, on testing, gave no evidence of possessing anæsthetic or mydriatic properties.

The experiments reported in the papers above quoted were all made, we learned, with a *solution* of gleditschine or steno-

carpine. On request to Dr. Seward, the discoverer of the alkaloid, for a sample of this solution, he referred to Messrs. Lehn & Fink, of New York, from whom alone he states a solution of this alkaloid could be obtained.

An analysis of this solution disclosed 6 per cent cocaine and a sulphate of a salt, which, it is probable, further investigation will prove to be atropine.

We have pleasure in submitting in this connection the report of F. A. Thompson, Ph. C., of our analytical department, a perusal of which will make clear the facts above presented, and show physicians who have already published reports on gleditschine that they have been made the victims of a clever hoax. The unscrupulousness of those interested in this fraudulent attempt to impose upon the medical profession can not, we think, be too strongly condemned or the facts too widely published.

REPORT OF F. A. THOMPSON, PH. C.

"Having had placed in my hands a sample of the solution of the new local anæsthetic, gleditschine, I made a chemical examination of this newly-reported discovery, the so-called rival of cocaine, made by Dr. Seward, of Bergen Point, N. J. (I take the liberty here of asking who is Dr. Seward?) I am able to draw the following conclusions in the limited time allowed: The contents of the bottle, measuring nearly a fluid ounce (26.5 C. c.) has a peculiar sweetish odor, and an amber-like color; sp. gr. 1.016 at 59° F., and from its syrupy like appearance, was suspected of containing more than 2 per cent of the salt of any alkaloid.

This is a copy of the label on bottle submitted:

· GLEDITSCHIN

$C_{26} H_{21} NO_3$

SO-CALLED

STENOCARPIN.

A new local Anæsthetic.

The salt not being permanent, this 2 per cent solution is recommended.

The name Stenocarpin was given this alkaloid by Dr. Seward, its discoverer, because of the close resemblance which the leaves from which he prepared it bear to those of the *Acacia Stenocarpa*; they have since been identified as belonging to the *Gleditschea Triacantha*.

Recent investigations have proven that in many cases it is preferable to Cocain, and in ophthalmic diseases superior to Atropin.

LEHN & FINK, - - - - NEW YORK.

Five c. c. allowed to evaporate slowly over sulphuric acid in a closed chamber, until of a constant weight, gave a residue weighing 400 m. g., indicating the presence of 8 per cent of soluble constituents, and in solid form of a dark amber-like color, amorphous, and almost free from odor. The alkaloid of 5 c. c. of the solution precipitated by the addition of a solution of caustic alkali, and shaken out with ether, gave upon evaporation of the several ethereal washings, and dried to a constant weight, an almost white, mostly crystalline residue, weighing 306 m. g., proving the presence of 6.12 per cent of anhydrous alkaloid, equal to about 6.85 per cent calculated as muriate. This residue (alkaloid) was again dissolved in ether, and allowed to evaporate spontaneously, when most of it crystallized into distinct acicular crystals, arranged in stellate form, which is a characteristic form in which its rival *cocaine* (!) alkaloid crystallizes. By a fractional crystallization from ether, about 92 per cent of the total alkaloid was separated as crystalline, the residue remaining in a soft amorphous condition. The separated alkaloids were converted into a muriate from which I have made 7 per cent solutions, and hope to be able to make some physiological experiments to determine if possible the presence of more than one alkaloid, the existence of which in the solution I have reasons for suspecting. A one per cent solution of the crystalline alkaloid, as well as the original solution, was submitted to Dr. Geisel's test for cocaine, of potassium permanganate, but I was unable to produce a crystalline permanganate salt of cocaine, the failure being possibly due to

its impurity, though this test often fails with the pure salt. I was, however, able to perceive the distinct odor of bitter almonds when slightly warmed—another peculiarity of cocaine (hygrin), which I am unable to find ascribed to any other alkaloid. A few drops of potassium permanganate gave the odor of bitter almond, also reducing a large amount of a solution 1 : 1,000.

A solution of 1 : 400 of the crystallized portion in the form of a muriate, produced with *platinum chloride* a yellow precipitate, of feathery-like crystals¹ in stellate form, resembling snow-flakes. *Chloride of gold* produced a distinct precipitate in solution containing one in 3,000, forming small *fern-frond* shaped crystals arranged somewhat in stellate groups. Mayer's reagent, a solution of iodine in potassium iodide, picric acid, and other alkaloidal reagents, produced precipitates of color, etc., peculiar to those ascribed to *cocaine*.

Qualitative tests were also made for sulphate and chloride with positive results, indicating the presence of quite a large percentage of chloride, and only a trace or more of sulphate, which results, as well as the physiological tests, prove almost conclusively that more than one alkaloid is present—probably cocaine hydrochlorate and atropine sulphate or some other mydriatic or even a myotic alkaloid, used possibly to counteract the action of the mydriatic.

Previous to any chemical examination, a few preliminary physiological tests were made upon myself and other self-sacrificing subjects. A drop was placed in the eye and after a few minutes the conjunctiva was thought to be less sensitive to touch. After 15 minutes, the pupil began to dilate, and at the end of thirty minutes, was so completely dilated as to cause considerable pain. This lasted for more than two days, and from its long-continued action left the eye quite sensitive to any strain. About 10 minims were injected into the fore-arm without any perceptible effect, and when applied to the tongue produced a benumbing sensation similar in every respect to

¹ *Amer. Jour. Phar.*, Oct., 1885, Lyons.

cocaine. One drop of the solution was put in the eye of a cat, and within a few minutes the conjunctiva was almost completely blanched and the pupil dilated, which lasted less than 24 hours.

My conclusions subject to further analysis which I hope may identify the exact constituents, are: 1. That the solution, claimed to be a two-percent. of gleditschine, is not what it is represented, and that those introducing it as such are guilty of fraud.

2. That the solution likely contains some coloring agent, differing from that obtained from the drug in which the alkaloid is isolated, or that the color may be due to the presence of an alkaloid, or the substance supposed to be in combination with the cocaine.

3. That the peculiar action of the extracted alkaloid to chemical tests, appearance, taste, and odor, suggest it to be none other than cocaine.

4. That the presence of chloride and sulphate indicates positively that a sulphate of one alkaloid and a muriate of another are present; and the presence of cocaine being established, which is without doubt in the form of muriate, the sulphate can be accounted for only by assuming that it is in combination with *atropine*, or some other mydriatic alkaloid, such as *duboisine*.

5. The solution contains 6.85 per cent. of alkaloid, calculated as cocaine muriate instead of 2 per cent. Gleditschine (!) as stated on label.

6. That the dilatation of the pupil of the eye was thought to be more lasting than from cocaine, and less so than from atropine, indicating the possible presence of some myotic, modifying the action of the mydriatic. Experiencing no dryness of the throat or any hallucinations from the hypodermic injection of the solution, it is possible no *mydriatic* except cocaine is present.

7. That the statement made, that the salt was not permanent, and finding the salt of the alkaloid in this solution quite

so, leads one to suppose that this is not the reason for making such an assertion.

8. That having had placed at my disposal through the firm of Parke, Davis & Co., several pounds of the leaves from which I am unable to produce as yet but a trace of alkaloid giving precipitates with the usual alkaloidal reagents, and which applied to the tongue, produces no sensation whatever, and the existence of a volatile constituent very probable, and a large amount of resinous-like substance having strong astringent properties being present, I question the existence of an anæsthetic or mydriatic alkaloid in *Gleditschia triacanthos*.

No new discovery to my knowledge has received such wide circulation in the medical press in so limited a time, as "*Gleditschine*," and for this reason, it will be unnecessary to give a description of the tree, *Gleditschia triacanthos* L., from which the leaves are obtained, and the part from which the new local anæsthetic is claimed to have been obtained. Viewing this enterprising scheme of making a 2 per cent. solution of *Gleditschine* as a money-making one, no doubt the perpetrators of the fraud have realized their aim, the solution costing the physician \$6 an ounce, and calculating the cost from the cocaine muriate found in it to be less than 50 cents, a handsome margin is left to the originators.

Without further commenting on this great discovery, I will leave the medical profession to form their own conclusions, advising them, however, to guard against a second *hopeine* swindle."

Respectfully yours,

Detroit, Mich., Oct. 21, 1887.

PARKE, DAVIS & Co.

DR. L. HOWE'S MISSION.

The following paragraph taken from the *Medical Press* of Western New York is herewith brought to the knowledge of our readers. We wish our esteemed collaborator a happy and successful journey and are sure that the investigation was placed in good hands. We eagerly await the results.

"The last census shows that while the population from 1870 to 1880 had increased at the rate of about 30 per cent., during the same time blindness had increased over 140 per cent. Moreover, an examination of the cause of eye disease in this country, shows that here, as elsewhere, a very large proportion is due to contagion.

At the last meeting of the New York State Medical Society a committee was appointed to investigate the causes of the increase of blindness in this country. The American Ophthalmological Society has also appointed a committee for the same purpose, and of both of these committees Professor Lucien Howe, of this city, has been made chairman. By resolution of the State Board of Charities he has also been asked for a special report on the subject in its relation to pauperism. In order, therefore, to study the more dangerous forms of conjunctival trouble it was deemed advisable by the committee to pursue the investigations in the countries where they were most prevalent, especially in certain portions of Asia and Egypt—the latter country above all others offering an excellent field of study. At the request of the President of the American Ophthalmological Society, the President of the New York State Medical Society, Dr. Wier Mitchell, and others, he has been given special letters by the Secretary of State to our Ministers and to the diplomatic corps in Germany, Italy, Egypt and throughout the East, so that being officially accredited, every possible opportunity for observation would be afforded. It is

proposed to study the causes of conjunctival diseases in the light of more recent bacteriological investigations, and for this purpose he will take with him the necessary apparatus, including two or three hundred culture tubes prepared with various media.

Dr. Howe expects to start in December. The entire study will probably be continued over two or three years, although it is possible that he will return next summer in order to begin work at the data which have been collected.

We only wish that other members of the profession in Buffalo were as progressive in their respective lines as Dr. Howe has shown himself to be in his specialty. We shall look forward to important results to be achieved by this investigation."

CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS.

A meeting of the Executive Committee of the Congress of American Physicians and Surgeons, for the purpose of organization, was held on October 5, in the Hall of the College of Physicians of Philadelphia. The special societies were represented as follows:

American Surgical Association, Dr. Claudius H. Mastin, of Alabama; American Otological Association, Dr. Cornelius R. Agnew, of New York; American Ophthalmological Association, Dr. D. B. St. John Roosa, of New York; American Laryngological Association, Dr. J. Solis Cohen, of Pennsylvania; American Neurological Association, Dr. L. Carter Gray, of New York; American Dermatological Association, Dr. I. E. Atkinson, of Maryland; American Climatological Association, Dr. A. L. Loomis, of New York; Association of Genito-Urinary Surgeons, Dr. John P. Bryson, of Missouri; American Association of Physicians, Dr. William Pepper, of Pennsylvania.

The committee was organized by the election of Dr. Pepper as chairman, and Dr. Bryson as secretary.

It was decided to hold the Congress of 1888 in Washington, D. C., on Tuesday, Wednesday, and Thursday, September 18, 19, and 20, respectively. The sessions of the Congress will be held in the evenings, leaving the mornings and afternoons free for the sessions of the special societies participating. The following officers were elected: President—Jno. S. Billings, M.D., LL.D., U. S. A., of Washington, D. C. Vice-Presidents—The Presidents-elect of all the participating societies. Treasurer—Dr. W. H. Carmalt, of Connecticut.

The arrangement of the programme for the sessions of the congress was referred to the President, the Secretary and the Chairman of the Executive Committee.

DONDERS MEMORIAL FUND.

A committee has been formed in the Netherlands in order to celebrate the seventieth birthday of an eminent man of science, Professor F. C. Donders, of Utrecht, on May 27, 1888. On that date the law requires him to resign his duties as Professor at the University and as director of the physiological laboratory, and it is now contemplated on that occasion to connect his name in a permanent way with the spot where he has lived and worked for more than forty years, by the creation of a fund, devoted to a scientific purpose and which shall be known as the "Donders Memorial Fund." The rules and by-laws according to which this fund is to be governed as well as its more special destination will be drawn up and fixed with the concurrence of Prof. Donders and will be made to correspond most fully to his own wishes.

We trust that his contemporaries and admirers, as well as the foreign scientific bodies, that have conferred their honorary distinctions upon him, and the numerous friends and colleagues with whom he has been more closely associated during his long career of original research and of university teaching, will co-operate with us in honoring a name so well known both in the field of biological science and of ophthalmology.

We have the honor to enclose a list for subscription to the purpose above enunciated and kindly request you to bring this under the consideration of those whom you think might be willing to contribute towards the formation of the "Donders Memorial Fund."

Mr. J. Roell, Member of the States-General, President, The Hague.

Mr. A. D. Van Riemsdijk, Master of the Mint, Secretary, Utrecht.

Dr. P. Q. Brondgeest, Lecturer at the University, Physician, Utrecht.

Dr. A. A. W. Hubrecht, Professor at the University, Utrecht. *Executive Committee.*

The editor of this journal will gladly transmit any contribution to this most commendable enterprise.

CORRESPONDENCE.

OMAHA, NEB., OCTOBER 22, 1887.

EDITOR AMERICAN JOURNAL OF OPHTHALMOLOGY:—Your article (AM. JOUR. OF OPHTH., Feb., 1887) and that of Culbertson (ibid., April, 1887) call for some reply to the supposition advanced by myself that possibly the germs which cause sympathetic ophthalmia may follow the course taken by the posterior lymph stream, in passing from the first to the second eye, *i. e.*, that they leave the optic nerve with the central vessels and pass along these to the cranial cavity, thence to be carried down between the sheaths of the second opticus, by the stream passing from the cranial cavity into the inter-vaginal space.

In both the articles mentioned, in describing eyes enucleated for sympathetic ophthalmia, stress is laid on the absence of marked inflammatory changes in the central canal of the opticus, as evidence against my supposition. But it should be remembered that even if this supposition be correct, the central canal need be involved only in those cases where the injection proceeds from the vitreous of the first eye; in the large proportion of cases where the vitreous is not infected, the germs pass back from the anterior chamber or ciliary body in the choroid and supra-choroidal space to the optic nerve and only after having reached the inter-vaginal space do they come under the influence of the posterior vitreous stream, which sucks out the contents of this space as it leaves the nerve with

the central vessels. In such cases, therefore, we should expect to find inflammatory changes not necessarily in the central canal, but in the choroid, in the peripheral ends of the nerve sheaths and the inter-vaginal space, especially at the point where the sheaths are pierced by the central vessels, and also in the orbital tissue in the neighborhood of this outlet. Hence, in examining enucleated eyes, special attention should be given to this region. Of course, a negative "find" is of value only in an eye that has caused sympathetic inflammation, not simply irritation. Sincerely yours, H. GIFFORD.

EDITORIAL NOTICE.

On account of a damaging fire in the publishing house of J. H. Chambers & Co., this number has been very materially delayed.

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SOME REMARKS ON CONGENITAL CATARACTS.

BY ADOLF ALT, M.D., ST. LOUIS.

It is a strange fact that a great many children are yearly entered as pupils in the different schools and asylums for the blind, which by an operation may be rendered seeing and useful members of the human society. Yet, the few of these institutions which I had occasion to see and examine have proved this to be a fact. Most of these operable cases are cases of so-called congenital cataracts, and the majority of them seem to be cases of zonular cataracts. From the rules which usually prevent pupils from entering schools of the blind until they have reached a certain age, it follows that most of such cases seen in these schools are no longer infants, sometimes they are even adults. The cases of congenital cataract we occasionally see in private practice are different in this point, as they usually are brought on at an early age. Even in private practice, however, these patients have sometimes attained a considerable age before coming for an operation, either because the cataract is a progressive one, or because they finally find too much trouble in following their vocation with what little vision they possess.

Although of late a number of authors contend that there

is no such thing as an *amblyopia ex anopsia*, the experience with cases of congenital cataracts, I think, proves it undoubtedly to exist. When, for instance, as I have seen it, V is only, perhaps, $6/\text{cc}$ right after recovery from the operation and increases in the following steadily up to say $20/\text{x}_1$, there has clearly existed in such an eye an *amblyopia ex anopsia*. I think, therefore, the earlier such children are operated upon the better, and every school for the blind should see that all applicants are carefully examined and operated upon, if some result may be expected from an operation, by competent oculists, before being accepted as pupils. The value of such a law is evident. Not only would it render the operable individuals as early as possible seeing citizens, but it would thereby remove a considerable percentage of the pupils from blind schools and thus save unnecessary expense to the community, or at least make room for more really and incurably blind individuals to be taken care of. These sentences may be considered truisms, yet, although not containing anything new, I think them worthy of reiteration, until they have produced a practical effect. It has been my experience that not only are such operable cases admitted to schools for the blind without hesitation and kept there, but there exists even, often in my experience, a certain hesitation in allowing such pupils to be operated upon, when I think the community should *insist* upon its being done. This hesitation I could never understand, except in the case of those institutions which are supported solely or almost so by the work of their pupils. Here the anxiety to lose a certain percentage of workers every year can explain it. In the institutions which are supported by the government, state or community there can be no pardonable reason for it, unless it be a doubt in the possibility of a successful operation. Where there is such a doubt it should be removed by the diffusion of knowledge by teaching the public what can and ought to be done in such cases.

In the following I wish to consider shortly the different forms of congenital cataracts in their clinical aspects and give the results of my own experiences with them.

What do we call congenital cataracts? As yet the question is a mooted one, whether congenital cataracts really exist or not. Some authors doubt the fact that children are ever born with cataracts and maintain that the cataracts are formed after birth only. Other authors go so far as to maintain that all infantile cataracts are congenital. O. Becker, for instance, gave it as his opinion that pyramidal cataract is the result of an intra-uterine perforation of the cornea followed by an adhesion of the anterior pole of the lens to this membrane. Later on this adhesion disappears, but as its result we have a pyramidal cataract. This idea sounds plausible enough. However, if the corneal perforation was large enough to produce such important changes in the crystalline lens, why is it that we find the cornea in most of the cases of pyramidal cataract perfectly clear and no remaining scar on it. Ever since Becker gave this idea to the public I have especially looked for corneal scars in cases of pyramidal cataract and I have to see the first one yet. This does not argue well for Becker's explanation, although it has been adopted by Michel, Meyer and others.

It is true most cases of infantile cataract are seen at least several months after birth, and it is, therefore, hard to decide whether in a given case we have to deal with a congenital cataract or not. That children are sometimes born with cataract is an undeniable fact. I had myself once occasion to see a case of congenital total cataract in a baby twenty-four hours old. Such observations make it clear that there is such a thing as congenital cataract. Practically, it makes, however, no difference whether an infant was born with cataract, or whether a cataract begins to develop within some months or even a year after birth.

The term "congenital" cataract might, therefore, well be done away with, and in its stead we might best use the term "infantile" cataract, in contradiction to "juvenile" and "senile" cataract. Infantile cataracts would then include all forms of cataract found in the infant or being known to begin their development in the first year or so after birth.

What forms of infantile cataract are known? The infantile cataracts may be divided into two large groups, viz., the total and the partial ones.

The total cataracts in which the whole of the lens-substance is dim, may be soft or hard; a third form has been called membranous cataract or shrunken cataract. In this latter the softer contents have probably become absorbed by exosmosis. The remainder is usually a shriveled up capsule containing some, frequently very hard, dim lens-substance.

The partial cataracts also appear in different forms. In the pyramidal or anterior polar, a stationary form of cataract, we find a peculiar degeneration of the lens-substance at the anterior pole or very near it, projecting teet-like into the anterior chamber. Zonular cataract is that form in which one, two or more layers of the lens-substance are dim which lie intermediately between the transparent most superficial layers and the nucleus. The nucleus may have the normal consistency or be very hard. This form of cataract is mostly stationary. In a number of cases, however, such zonular cataracts are progressive. The so-called posterior polar cataract does not seem to be in reality a cataract, that is, a dimness of the lens-substance, but to consist of remnants of the hyaloid artery attached to the posterior lens-capsule.

What is the etiology of infantile cataracts? The different authorities differ with regard to the causes of infantile cataract. It has been found by Arlt that many infants with cataract have been subject to spasms. However, Foerster and others think that zonular cataract is of rhachitic origin. McNamara says zonular cataract most frequently depends on hereditary syphilis. I have seen a brother and sister affected the one with zonular, the other with total cataracts, whose father and mother were first cousins. Becker, as stated above, thinks that anterior polar cataracts are due to an anterior synechia between lens-capsule and cornea. The cases of infantile cataract I have had occasion to see have not cleared up anything with regard to their etiology. But I am inclined to

think that McNamara's view surely is not a correct one, since I never found hereditary syphilis in any of my cases. Maybe, that such an affection might have been found to have existed in the grand-parents or even farther removed, if the family history of all the cases were thoroughly known. Direct evidence was surely wanting in my cases. Signs of rhachitis were present in some, a few had had spasms, but in the majority of them no cause could be directly demonstrated.

When are the cases of infantile cataract operable? This question is very simply answered when the patients are old enough to help in the examination of their visual sense. In small infants and especially in total cataracts it may be a very hard thing to decide whether a case is operable with any prospect of sight or not. The smallest evidence of perception of light would, of course, invite an operation. Yet, we know that in a certain percentage of these cases the cataract is not the only pathological condition found in the eye. In spite of these considerations, however, I am of the opinion that, as long as no visible complication exists which *a priori* forbids us to operate, we should operate on every case of infantile cataract, the chances for improvement being infinitely greater than those for the reverse. Even when no perception of light can be proven before the operation, some degree of vision may be established by the operation, and should really nothing be gained, what is likely to be lost?

At what time should we operate? Since I strongly believe in an *amblyopia ex anopsia*, I should always operate as soon as possible. This means, that given the opportunity in an otherwise healthy baby, with a total cataract, I should operate even after the first three months of life. Parents are, however, not likely to consent so early. In cases of stationary partial cataract we may well wait until the patient has attained such an age, that with his help we are enabled to form a distinct opinion with regard to the conditions before us. Yet, I think we should not hesitate a moment longer than necessary, since we lose valuable time and, perhaps, not only a decided influence upon the child's sight, but also upon its character and thus upon its whole future.

What kind of operation is to be performed? The forms of operation which to-day we may consider in cases of infantile cataracts are three, viz., extraction, discission and iridectomy. The cases of infantile cataract in which it is practicable or imperative to perform extraction of the cataract are but few, and primarily this only concerns the cases of total cataracts. But I would like to reduce their number still further. I think it is unnecessary to perform extraction, except in cases of shrunken cataracts. Even the hard total cataracts which are usually extracted will give way to discission. Although in the extraction of infantile cataracts it is but seldom necessary to make an iridectomy, yet this may become necessary against our wish, and on the other hand the corneal section, aside from the probable astigmatism, exposes the eye to graver dangers than the operation of discission. In the latter operation with the necessary care we have the iris intact and have, when all is done, a round, moveable pupil (excepting cases combined with congenital coloboma). While in the different forms of total cataract we have to decide between extraction and discission, in the different forms of partial cataract our choice lies between iridectomy and discission. The merits of these two methods of operation in cases of zonular and anterior polar cataracts have been so often and so ably discussed that it is not necessary here to repeat the whole chapter. My experience from my own cases and cases which I saw operated upon by others or after operations by others, is that the percentage of cases in which iridectomy is of a practical value is almost *nil*. Theoretically considered, I should, as others do, give iridectomy the preference in all cases in which sight is considerably improved by a dilatation of the pupil *ad maximum*. Practically, I have found, as others undoubtedly have, that the result of such operations, as a rule, does not come up to our expectations. Herein I know I differ with most of the text-books. But I have had occasion to needle cases in my practice after I or some other surgeon had from theoretical reasons performed iridectomy, and where the result of the division was by far superior even to the iridectomies performed by the most skillful

operators. While, therefore, with most surgeons it seems to be the rule in cases of partial cataract to perform iridectomy, with me it has been the rule to perform discission and to repeat it until the best possible result is obtained. True, even discission has its dangers. Yet, I do not think many will have such bad luck with discission as has been reported in one unfortunate case in which iridectomy for zonular cataract was followed by the loss of both eyes. The results of discission with regard to vision are, I think, very considerably superior those of iridectomy in the great majority of the cases.

In the following I append a short description of 37 operations performed on 26 patients for infantile cataract.

1. E. M., æt. 27, progressive zonular cataract both. Myopia. Discission R. Hard nucleus removed by extraction to gain time. Result good.

2. F. A., æt. 23. Zonular cataract both. Pupil in blind school. Discission both. Result, $V = \frac{20}{1xx}$ R., $\frac{20}{1}$ L.

3. L. McD., æt. 21. Had zonular cataract. L. was operated upon by some other surgeon and lost by suppuration. R. totally blind for 5 years. Pupil of blind school. Eye soft, now total cataract and posterior synechiæ. Preliminary iridectomy. Extraction. Result first very poor, 6 months later very good.

4. T. S., æt. 20. Zonular cataract both, progressive. Can no longer earn his living. Discission. Result, R. $\frac{20}{c}$, L. $\frac{20}{1xx}$.

5. A. B., æt. 19. Zonular cataract. Discission L. Result, $V = \frac{20}{1}$.

6. L. F., æt. 18. Partly shrunken cataracts, both. Pupil of blind school. Discission both. Result but poor.

7. F. M., æt. 16. Zonular cataract both. Discission L. Result, $\frac{20}{1}$.

8. L. T., æt. 16. Pupil of blind school. Micro-cornea, microphthalmus. Anterior polar cataract both. Discission. Result, no improvement. Fingers at 5 feet.

9. L. W., pupil of blind school. Shrunken cataract both.

R. extraction. Result, $V=^{20}_{1xx}$. L. Discission. No improvement.

H. D., æt. 14. Pupil of blind school. Cataracta mollis totalis both. Discission. No improvement. Atrophic optic nerves.

11. E. S., æt. 10. Zonular cataracts both. Discission L. Result, only slight improvement at first. Later on, considerably better.

12. K. M., æt. 14. Cataracta zonularis both. Discission R. Result, $V=^{20}_{xl}$.

13. F. E., æt. 15. Zonular cataract both. Discission L. Result $V=^{20}_1$.

14. L. B., æt. 12. Zonular cataract both. Discission R. Iritis, posterior synechia. Extraction of nucleus. Result, $V=^{20}_{1xx}$.

15. Ph. T., æt. 15. Zonular cataract both. Discission L. Glaucomatous symptoms relieved by leeches. Result, $V=^{20}_{xxx}$.

16. E. S., æt. 9. Zonular cataracts both. Discission L. Result, $V=^{20}_{xxx}$.

17. M. J., æt. 11. Pupil of blind school. Cataracta mollis fere totalis both. Discission. Result good.

18. M. J., æt. 9. Pupil of blind school. Cataracta mollis fere totalis both. Sister of former (colored). Discission. Result good.

19. L. B., æt. 1. Zonular cataract both. Exquisitely rhaphitic. Discission both. Result, $^{20}_{30}$ both.

20. J. M., æt. 7. Total cataract both. Discission R. Result, $V=^{20}_1$.

21. E. B., æt. 3. Total cataract both. Discission L. Result tested two years later, $^{20}_{1xx}$.

22. P. B., æt. 2. Total cataract both. Discission R. Result good.

23. E. B., æt. 4. Total cataract both. Paralytic in lower limbs. Intelligence below par. Discission both. Result good.

24. P. C., æt. $1\frac{1}{2}$. R. shrunken cataract. Extraction. L. cataracta zonularis. Discission. Result good.

25. E. B., æt. 7. Cataracta totalis both. Discission R. Result, sight at first very poor. A year later $\frac{20}{1}$.

26. L. S., $1\frac{1}{2}$. Cataracta totalis fere matura R. Discission. Result good. L. so far free from cataract.

From the foregoing it will be seen that of the 26 patients 13 had zonular cataract in both eyes; 10 had total cataract (2 shrunken) in both eyes; 1 had pyramidal cataract in both eyes; 1 had a shrunken cataract in one and a zonular in the other eye; 1 had a total cataract in one eye alone.

A RARE FORM OF OPHTHALMIA GRANULOSA ASSOCIATED WITH ICHTHYOSIS.

BY F. BULLER, M. D., MONTREAL, CANADA.

It is, I believe, a generally recognized fact that certain cutaneous eruptions or morbid conditions are also met with on the conjunctiva. Eczema, pemphigus, lupus, lepra and epithelioma, have all been seen either as primary affections of the conjunctiva, or associated with similar conditions elsewhere. The comparative immunity of the conjunctiva from participating in diseases of the general integument would however be somewhat remarkable were it not for the obvious anatomical and functional differences between these two structures, circumstances which of themselves must materially modify any influence that tends to induce pathological changes in these parts.

The concurrence of certain well marked and characteristic changes in tissues or structures that have no direct connection with each other, except that they are mutually dependant on the same nutritive processes, is a matter of daily observation, and I only allude to it as bearing on the pathology of the two cases I am about to present, both of which are the subjects of skin disease known as ichthyosis.

The affection of the conjunctiva is identical in each so that one description will serve for both; but there are certain differences in their general condition which must be referred to separately.

The first case is that of a boy aged 15 who has had several attacks of rheumatism and whom I treated two years ago for chronic iritis, from which he made a perfect recovery after some four months' treatment. I did not at that time notice any disease of the conjunctiva, though I have little doubt that such existed even then. Six months later he was again brought to

me on account of not being able to use the eyes without discomfort. An inspection of the eyelids then revealed the changes presently to be described.

He is the son of healthy parents, neither of whom have ever had any disease of the skin, four of their children are equally free from the same; but this boy and two of his younger brothers present that peculiar rough and scaly condition of the skin of the legs and arms which belongs to mild forms of ichthyosis. The skin is everywhere dry and harsh, the normal skin-lines especially of the hands are considerably exaggerated. In all three the changes are almost precisely similar but rather more conspicuous in one of the younger brothers than in the patient.

They are all alike in being worse in the winter than during the summer. In early infancy they suffered from acute eczema, but for several years afterwards the mother, an educated and observant lady, states positively there was no evidence of skin disease, the present condition having developed gradually several years after birth.

In the winter season the skin of the face has a harsh, stiff appearance and is more or less scaly, and there is a scaly and somewhat reddened condition of the edges of the eyelids.

The second case is that of a boy 11 years of age, whose father has been subject to "salt rheum" for many years. Two of his brothers are similarly affected, but the mother is a robust healthy woman.

This child suffered much from acute eczema during the first year of his life and has had several attacks since. His skin has never been really healthy in appearance, and for some years there has been an increasing accumulation of epidermic masses on certain parts of the extremities. The skin generally is harsh and rough, and its normal lines are everywhere increased; about the knees and elbows there is an enormous quantity of dark colored epidermis subdivided by minute fissures in innumerable polygonal areas. This condition exists to some extent on the flexor aspect of the elbows. The skin affection is said to be even more conspicuous in the winter than in the

summer season. The integument of the face is coarse looking, tense and somewhat scaly, and there is a good deal of exfoliating epithelium on the scalp. The edges of the eyelids are slightly reddened, and there is a considerable quantity of dry epithelium about the roots of the eyelashes. The boy is well developed, and in other respects enjoys excellent health.

For two or three years at least the boy has been known to have weak eyes; all the other members of the family are said to be free from any such weakness. During the past month or thereabouts, the eyes are said to have been weaker than usual, and there is a moderate intolerance of light. Beyond a perceptible hyperæmia of the ocular conjunctiva and a slight drooping of the eyelids there is nothing abnormal in the external appearance of the eyes. Under atropine there is compound hyperopic astigmatism = $+1.50 \text{ s} \subset +2.50 \text{ c}$, $V=^{20}_{xx}$.

The conjunctiva of the lower lids is somewhat swollen, has a smooth and rather glazed appearance, and presents several longitudinal ridges, without any of the rounded bodies of follicular conjunctivitis or of trachoma. A long string of pale yellow, extremely tenacious mucus, occupies the lower retrotarsal fold.

On everting the upper eyelids the palpebral conjunctiva appears remarkably pale and also glazed or as if varnished. The pallor is that of a greyish faded pink, with a more pronounced pink at the ends of the lids and along the posterior border of the tarsus.

The palpebral surface is somewhat more extensive than normal, and the entire eyelid perceptibly thickened. The conjunctival surface, though smooth, has a remarkably uneven appearance, owing to the presence of large numbers of flattened elevations which are separated from each other by narrow fissures. These elevations are quite irregular both in size and shape, varying from one to two millimeters in diameter; the larger and more rounded ones are at the posterior border of the tarsus, though even here their surfaces are distinctly flattened. Some, like minute mushrooms, are considerably broader at the surface than at their attached portion. Under a

strong magnifying glass they all appear semi-transparent, almost gelatinous, and their faint red tinge is seen to be due to innumerable minute rusty red dots scattered throughout their substance; these dots are undoubtedly fine capillary loops, since they become larger and more numerous when the part is irritated by friction. But their most striking characteristic is their extreme hardness; when incised strong pressure between the thumb nails fails to make the slightest impression on any but a few of the redder ones near the posterior edge of the tarsus. Some of the latter I succeeded in crushing in this way.

Two of the largest, near the posterior edge of the tarsus were removed for microscopical examination. Sections made through these unfortunately did not demonstrate the condition of the epithelium or its relation with the underlying structures. They did, however, clearly show that the excised granulations were made up of highly developed granulation tissue, containing a very large proportion of white fibrous tissue in the form of wavy bands, and in parts the cellular elements preponderating. Vertical sections showed an abundance of this tissue in the superficial as well as the deeper portion of the granulations. While the general characters of these structures correspond to that of ordinary trachoma their connective tissue elements were greatly in excess, as might have been predicted from the microscopical features already mentioned.

No microscopical examination was made of the first case, but it was in all respects so nearly the counterpart of the one examined, that I have no reason to doubt the granulations would have been found identical in their minute structure had such an examination been made in both. In the second case no special treatment was prescribed, but in the first various remedies known to be efficacious in the treatment of trachoma (especially the sulphate of copper) were tried faithfully for nearly a year; but without the slightest perceptible benefit, as far as the size and number of the granulations, or the appearance of the conjunctiva was concerned.

I have, among hospital patients, several times seen cases of trachoma precisely similar to these and always equally rebel-

lious to treatment, but I do not remember ever having examined the state of the general integument in any of these, and am therefore unable to say whether any chronic skin disease was associated with these also.

It is very evident, however, that the two cases I have just described differ widely from the ordinary forms of trachoma.

1. They differ in the form, size and color of the granulations and especially in the extreme hardness of these structures.

2. In the absence of any tendency to the inflammatory exacerbations, the first case, though under observation for more than a year, never at any time showed any change in the condition of the conjunctiva. The second case, though evidently of several years duration, had never at any time shown the least tendency to acute exacerbations, nevertheless it had already arrived at what would under ordinary circumstances be regarded as a very advanced stage of the disease.

3. The first case differed from ordinary trachoma in its absolutely passive behavior under ordinary treatment.

4. The character of the secretion was not that of any ordinary form of trachoma, but rather such as we sometimes see in commencing parenchymatous xerosis. But in these cases atrophy of the conjunctiva was not a conspicuous symptom. Indeed the retrotarsal folds and fornix were almost healthy in appearance.

5. That they were non-contagious is almost certain.

The pathological changes, it will be seen, were confined chiefly to the palpebral conjunctiva of the upper eyelids. Now this is just the part of the conjunctiva that in its anatomical structure bears the greatest resemblance to the general integument, which we have seen was also subject to certain chronic changes analogous to those in the conjunctiva. If, as seems probable, the conditions really depend on the same error in the state of general nutrition, they may, on taking the above facts into consideration, be regarded as identical in all respects excepting in situation.

For this peculiar form of trachoma then we might perhaps

be justified in employing the designation ichthyosis of the conjunctiva.

The obvious relation, which these cases seem to indicate, of eczema and ichthyosis naturally suggests a question in pathology which we may leave to the dermatologists for answer.

ON A NEEDED REFORM IN VISUAL RECORDS.

BY HAROLE B. WILSON M. D., ANN ARBOR, MICH.

Common factions are either a necessity or a nuisance. If they are a necessary part of our case records, we must stand by them, if they are not, the sooner we are rid of them the better. The dioptric system has banished them from our refraction formulæ, and it only remains to eliminate them from our records of visual acuteness, to be completely quit with them. Indeed it is surprising that this reform has not already taken place. At present our books are burdened by such expressions as these: $V = \frac{6}{6}, \frac{15}{18}, \frac{20}{20}, \frac{20}{80}, \frac{1}{2}$, etc., to signify the ability of the eye to distinguish certain small objects at a distance. Normal vision is represented by $V = \frac{20}{xx}, \frac{6}{6}$ or sometimes by 1. Similarly $V = \frac{20}{30}, \frac{20}{40}$, etc. has been expressed by $V = \frac{2}{3}, \frac{1}{2}$, etc., and if we carry out the reduction in all cases, we get an irregular series of expressions difficult to correlate with each other, and always open to the objection of being common fractions. If we agree that these expressions when in their lowest terms, mean the same thing as when unreduced, a way is opened towards attaining a much desired simplicity, and of doing away with the objectionable features of numerator and denominator.

It is probably true that the ordinary expression $V = \frac{20}{40}$ does not strictly represent one-half of the normal visual power, if we consider this to range from the ability of the eye to distinguish the letters of Snellen No. 20, at twenty feet, to the lowest limits of qualitative vision, or to absolute blindness, if you will. There is a vastly greater difference between $V = \frac{20}{40}$, and $V = 0$ than between the former figure and $V = \frac{20}{20}$. For clinical purposes, however, it seems to be a safe assumption that visual acuity may be measured by the ratios between the heights of the smallest letters distinguished at a given distance from the

eye, and that these ratios may be expressed in terms of the series 1., 0.9, 0.8, 0.7, etc., 0.09, 0.08, etc., the intervals of which can be made to serve all necessary accuracy, and which is extensive enough for all practical demands. Thus, instead of writing $V = \frac{20}{20}, \frac{20}{40}, \frac{20}{100}, \frac{18}{200}, \frac{10}{200}$, etc., we may write $V = 1., 0.5, 0.2, .09, .05$, etc.

If a equals the height of the five minute letter for twenty feet, y' , that of any other letter, and v the expression for visual

acuity, then $y' = \frac{a}{v}$ expresses their relation, and since the height

of the letters is proportional to the farthest distance at which they can be distinguished (when the letters have an equal height and breadth,) the same values of v substituted in $x = \frac{20}{v}$ will give x which is the number of feet these letters with the height y' , can be read. Thus, if normal vision can distinguish letters .3491 inches high at twenty feet, at 22.2 ft., 25 ft., 28.6 ft., 33.3 ft., 40 ft., 50 ft., etc., they would have to be approximately .35 in., .39 in., .44 in., .5 in., .58 in., .87 in., etc., high respectively, to be seen, and if we construct a plate of test type from these letters, they will serve to measure the visual sense, so that it can be expressed as 1, 0.9, 0.8, 0.7, 0.6, 0.5, 0.4, etc. If the first few intervals of the series are too close, some of them, such as 0.9 and 0.7, may be omitted, and similarly if the gap between 0.2 and 0.3, is too great, we may insert the value of 0.25.

Now accurately and properly to carry out the plan I have proposed, involves the construction of a new series of test type, but in default of this, the ordinary Snellen plate may be used without much inaccuracy, the numbers corresponding to the new values of V , as follows:

| | | | | | | | | | |
|----------------|---|---|----|------|-----|-----|------|-----|-----|
| Snellen No., | - | - | XX | XXX | XL | L | LXX | C | CC |
| Visual acuity, | - | - | I. | 0.7— | 0.5 | 0.4 | 0.3— | 0.2 | 0.1 |

For values less than 0.1, the patient moves toward the test type, and we have $V = \frac{18}{200} = 0.09$ etc.

The advantages accruing from adopting the decimal notation in the visual record will be the simplicity of its form, and

the harmony and correlation between its various expressions, and no violent revolution of any sort is necessary to carry it into effect. If it is desirable to use the meter unit instead of the foot, and to consider six meters instead of twenty feet as infinite distance, the figures given above will be altered, but the usefulness of the principle involved will not be impaired, nor its adoption in any degree more difficult.

For near vision, the present system is perhaps the most convenient, particularly since reading tests are usually approximate estimations only; but were it is desirable to effect a change here, the records could be cast into a decimal notation in a manner similar to that used for the far point.

Further than this, the proposition explains, and I trust, commends itself.

TWO CASES OF ACUTE CHEMOSIS OF THE CONJUNCTIVA.

BY G. E. DE SCHWEINITZ, M. D.

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Zehender (*Klin. Monatsbl. f. Augenheilk.*, June, 1870), under the title of "Acutes Bindehautödem", records the case of a patient 55 years of age, convalescing from pneumonia, who, after a day of headache and catarrh, had chemosis of the conjunctiva looking like a bladder. Six days later this had entirely disappeared from both eyes. Dr. Swan M. Burnett (*Archiv. of Ophthalmology*, vol 9, p. 157) has recorded an example of this affection which occurred in a man aged 29, a student of great activity. The eyes were emmetropic. In the periphery of each fundus there were spots of atrophic choroiditis, and in the right eye near the macula a few pigment spots. Quinine and coquilles were ordered. Three days later Dr. Burnett was sent for because, on the previous evening, the patient was seized with intolerable pain in the left eye and left side of the head, which had lasted through the night. The eyes were sensitive to light, but there was no especial injection of the conjunctiva. On the following day there was marked chemosis of the conjunctiva, two days later the symptoms had subsided, and at the expiration of a week the eyes were in a very satisfactory condition.

Recently two cases of sudden, acute chemosis have come under my observation, and for various reasons their brief record seems valuable.

CASE I.—Jas. M., aged 40, was an inmate of the venereal wards of the Philadelphia hospital. He was the subject of syphilis in its later manifestations, the active lesion being a

large ulcer over the centre of the right tibia. The patient had for some time been taking ascending doses of iodide of potash and was at this time using one drachm three times a day. For a day before his admission to the eye-ward, he had severe pain in the eyes and head and slight pericorneal injection. The resident physician, thinking he had to deal with a case of incipient iritis, instilled a drop of atropine solution and sent him to the eye-ward. The following day there was intense chemosis of the right conjunctiva, which surrounded the cornea in a large roll, and fairly protruded through the palpebral fissure. The intolerable pain continued so that an artificial leech was applied to the temple. During the day a similar state of affairs developed in the left eye. The iodide of potash was discontinued, the eyes occasionally washed with a saturated solution of boric acid, and the swollen conjunctiva touched with an alum crystal. During the next twenty-four hours the swelling disappeared as quickly and quietly as it had appeared. For a few days after its subsidence the conjunctiva remained hyperæmic. There was nothing noteworthy in the fundus of either eye.

CASE II.—Chas. M., aged 35, came to the eye wards because of very imperfect vision and intense head pains. Acuity of vision was reduced to counting fingers in each eye. The ophthalmoscope showed a beautiful picture of symmetrical disseminated choroiditis with string-like opacities in the vitreous. The man had contracted the initial lesion of syphilis ten years previously. As he was well nourished and in apparent good form he was placed on inunctions of mercurial ointment, one drachm night and morning, and given full doses of bromide of potash at night. The sight slightly improved but the headache continued. The bromide was then discontinued and fifteen grain doses of antipyrine substituted, which acted very happily. At the expiration of one week the mercury was stopped and the man put upon ascending doses of iodide of potash, beginning with thirty grains, three times a day. This was increased until he was taking three drachms a day. One evening he had a severe head-pain accompanied by slight irritation in and

around the eye. The next morning there was enormous chemosis of the conjunctiva, which was literally piled up and bulging through the fissure of the lids, with a crater-like excavation, at the bottom of which could be seen the cornea. The right eye was first and more decidedly affected than the left. The iodide of potash was discontinued, a saline purge ordered, and no local treatment, except an occasional washing with boric acid solution, instituted. In twenty-four hours the swelling had much diminished, and in two days more had practically disappeared. No similar attack had ever occurred to the patient in his previous history.

Dr. Burnett in his article discusses the usual causes of chemosis, namely, such as are active, where there is inflammation of the uveal tract or of the conjunctiva, and such as are passive where the fluid exudes passively, as in the ordinary cases of œdema from relaxed walls. He concluded that neither of this class of causes was predominantly present in his case, and looked upon neuralgia of the fifth pair as the exciting agent which had produced an hyperæmia of the conjunctiva that the diseased condition of the choroidal virus was unable to contend with, and chemosis resulted. This very satisfactory explanation applies with equal force to the cases I have just briefly recorded. A specific neuralgia of the fifth pair, associated in the one instance with extensive disease of the vitreous and choroid, will certainly suffice to explain the chemosis, especially in the light of the fact that neither active nor passive causes of this condition were notably present. The association of chemosis with paralysis of one or more of the eye-muscles must not be lost sight of, but such palsy, although a most likely condition in either of the cases, did not exist. Another possible explanation in the present instances is worthy of consideration, and for this reason in part they have been reported. Both of the men were under the influence of large, even if they were not unusual doses, of iodide of potash; in both of them the swelling of the conjunctiva subsided when this remedy was discontinued. The ordinary symptoms of iodism are familiar enough. Varieties known as the gastro-

intestinal, the nervous, and the iodic cachexia have been described (Bull. de l'Acad. Roy., XXV. quoted by Wood. Therapeutics 5th Edit.)

Cases in which extensive and dangerous cutaneous eruptions accompanied by stupor, and such in which death itself has ensued are on record. Iodide of potash is probably eliminated by all the mucous membranes, and quite certainly with the lachrymal secretion, as witness the disastrous results which occasionally follow the dusting of calomel into the conjunctival cul-de-sac of the patients under the influence of this drug. Hence it does not seem unreasonable to assume that this chemosis may have been a manifestation of iodism or rather may have been provoked into existence by the elimination of the remedy from the conjunctiva or with the tears, exactly as continued doses of arsenic produce œdema of the tissues about the eyes owing to the presence of a low-grade cellulitis which fills the connective tissue lymph-spaces with serum. Against this theory is the fact that the chemosis subsided before the system had time to throw off the accumulated drug, inasmuch as the elimination of iodide of potash takes place slowly. Although not entirely apropos I wish to call attention to the relief which antipyrine gave to one of these patients, in that it distinctly alleviated the suffering caused by severe syphilitic headache, when the bromides in conjunction with the specific treatment had signally failed.

EYE CLINIC.

BY W. CHEATHAM, M.D.,

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An obstinate case of mydriasis. Jessie B., aged 10, had been suffering from asthenopia with blephoritis marginalis for some months. When she came to me she had an acute muco-purulent conjunctivitis. I advised atropia sulph. gr. ss. to aqua ʒss., to be dropped into each eye four times a day. The father supposing sometimes that the drop did not get in well would repeat it; so she may have gotten the drop in each eye six times a day. The atropia was used in this way for one week. When there was no indication of a return of the pupil to its normal size for two weeks, and no return of accommodation, I became alarmed. I used pilocarpine and eserine, either of which would bring the pupil down but little, and retain it there a very short time. Electricity was used also. One day after the mydriasis had existed four weeks the pupils were natural in size, and accommodation was restored. The following day the mydriasis and paralysis of accommodation were again present. There was no indication of any central trouble, no symptoms of locomotor ataxia, and nothing to indicate any reflex cause. Notwithstanding all treatment, the trouble was not relieved up to the seventh week after the drops were used. The mother then suggested an old household remedy for worms. The patient had taken it before with benefit for other troubles, insomnia, etc. The pink root and senna were given until it purged the patient pretty well. After the third or fourth dose accommodation returned, and the mydriasis disappeared. This has been three months ago, and the patient is still well. No medicine that would produce mydriasis was given internally, and the drops that were used

in the eyes after the atropia was used, were in new bottles, and new droppers were used.

Miss F., aged 21, has had asthenopia for several years. Print runs together after reading a short time.

V. R. = $\frac{20}{xxx}$. No improvement with glasses.

V. L. = $\frac{20}{xx}$. Em. Ocular conjunctiva always congested. Some hyperæmia of conjunctiva. As usual in such young subjects, I put one drop of a solution of hydrobromate of homatropia gr. j, aquae \mathfrak{z} j, in each eye every ten minutes until it is put in six times, and then wait half an hour before testing vision again. At the end of the half hour I found ocular conjunctiva very much congested, much more so (which is not unusual) than before the drops were used. I found vision of each eye $\frac{20}{x1}$ only and no improvement with glasses. I put the homatropia in twice more, which still further decreased vision. The ophthalmoscope showed some disturbance of the corneal epithelium, or of some part of the anterior layers of the cornea.

I now put in two drops of a 4 per cent. solution of benzoyl, meth. ecgonin muriate, which soon cleared up all of the conjunctival congestion, and also the vision. The cocaine is said to and does if used several times in a short space of time, corrugate the corneal epithelium. I found in this case that it cleared up the cornea, and I had no difficulty in finding my patient had a small degree of Ah. In the last few days I have had a case like the last which behaved the same way with the homatropine and cocaine.

Four weeks ago I had a rather unusual case of myopia in a child three years old. The parents had observed that the little one did not see very well. Of course none of the usual tests for vision could be made. Atropia was used and accommodation paralyzed. The ophthalmoscope showed myopia of $\frac{1}{3}$. I never before saw a patient so young with such a high degree of myopia.

I have lately had two cases of gonorrhœal ophthalmia which interested me very much. One in a child six months old of an excellent family. It had been going on for six weeks.

There was great œdema of lids, with chemosis, and the right cornea was beginning to be involved. The next case was in a colored child three years old. I saw it the third day of the attack. Chemosis and œdema of lids were so great as to render a view of the cornea impossible. They were both on hand at the same time, and both were treated exactly alike. In all suppurative inflammations of the conjunctiva my dependence is on the nitrate of silver; I use it from gr. $\frac{1}{4}$ to ʒj to aquae ʒj, being very careful to use the salt water well afterwards. When the stronger solutions are used, I apply them myself; I have yet to see an eye stained by the use of the silver, or an eye lost when they are seen in time. In the first case spoken of, there is left a small, slightly opaque spot that can be scarcely seen by a strong light. The treatment I pursue, I suppose, has nothing new in it; cleansing and good nursing doing most of the work. In these two cases I advised cleansing every hour with surgical cotton and carbolized water. The lids to be kept well anointed with vaseline cerate to prevent excoriation of the skin. While the chemosis and œdema existed, and if much reaction followed the applications of the silver, hot cloths were applied an hour, then left off an hour. The other treatment is as follows: There is always great difficulty in cleansing the cul-de-sac, especially when there is much chemosis and œdema of lids. I have tried peroxide of hydrogen, but with no good result. I have found the glycerole-tannin ʒj, aquae ʒvj the best for the purpose. Besides its effect upon the disease, it coagulates the pus and muco-pus, so it will come out in strings, leaving none behind. This I order done four times a day if the weak solutions of nitrate of silver are used; if the stronger I use it myself twice a day. In the two cases referred to I commenced on a 1 gr. solution of the silver, increasing it slowly, as I found the disease would not yield, until in the first case I used gr. x to aquae ʒj, and several times in the second case gr. xL to aquae ʒj, dropped in the eye. As the disease appears to be under control, I decrease the strength of the solution slowly, but always wash out well afterwards with salt water. I have never

done a canthotomy in this disease. Have never found it necessary to do any cutting whatever, except in some cases where there are extensive marginal ulcers, I performed peracentesis of the cornea, and can now recall but one case, a woman, 35 years old, in which this was necessary. I use atropia in most all the cases, eserine when indicated. Cocaine never, because of its increasing the dangers to the cornea. I report these two cases because they were typical ones and because it is so unusual for me to see the disease in patients of that age. Dr. Weeks in his late article in the *Archives of Ophthalmology* puts nitrate of silver where I have always thought it should be, only second to hydrarg. bichlor. as an antiseptic.

TRANSLATION.

[Extracts from the Report of the Meeting of the Italian Ophthalmological Society at Turin. From *Hirschberg's Centralblatt*.]

PRESIDENT REYMOND.

Peschel presented a boy, fifteen years of age, with an idiopathic pulsating exophthalmus on the left side. Five months previously, after nine days of digital compression with no success, the carotis communis had been ligated. Although a considerable improvement resulted therefrom, yet there is still some pulsation and protrusion of the eyeball, aneurysmatic noise, slight ptosis, and paresis of the abducens muscle and hyperæmia of the optic papilla and retina. $V=^{10}_{xxx}$. A pulsating bloodvessel may be felt in the region of the incisura supraorbitalis. By exclusion of other possible affections the diagnosis of rupture of the carotis interna within the cavernous sinus is made. With regard to the etiology it may be interesting that the patient has frequently palpitations of the heart without an organic lesion.

Angelucci has seen a case of exophthalmus without pulsation, in which he made the diagnosis of angioma cavernosum. In this case there existed also a considerable nervous irritability of the heart.

Gradenigo thinks that a simple aneurysm of the carotis interna within the cavernous sinus can produce the symptoms of a pulsating exophthalmus and that in this way the papillitis and venous hyperæmia of the fundus oculi may be explained.

Angelucci opposes this view since not even a thrombosis of the vena centralis retinae is capable of producing a venous stasis in the retina. He is of the opinion that the pulsating exophthalmus is caused by an arterio-venous aneurysm in the

orbit, in the formation of which one of the larger branches of the ophthalmic artery takes part. He further thinks that a simple aneurysm of the internal carotid within the cavernous sinus does not produce any symptoms.

Peschel answers that in his case it is impossible to assume a simple aneurysm of the carotid within the cavernous sinus; that such an aneurysm would only produce a pulsating exophthalmus when developing rapidly and that the pulsations at once disappear when collateral venous circulation becomes re-established. This is the reason that slowly developing aneurysms or tumors within the sinus produce no symptoms in the orbit. He also draws attention to the fact that arterio-venous aneurysms have been repeatedly found at post-mortem examinations.

Peschel presented a girl, 28 years old, suffering from quinine amaurosis. On account of a slight catarrhal pharyngitis nine months ago she took only from 3 to 4 grains of sulphate of quinine in 6 days. This was followed by blindness and deafness. Five days later a certain degree of vision was re-established, but there was color-blindness and a high degree of contraction of the visual field. The latter was in both eyes a vertical oval around the point of fixation. High degree of ischæmia of the fundus oculi. At present there is still a considerable contraction of arteries and veins. The arteries are accompanied by white lines, slight atrophy of the optic nerve and in accord with this the field for white and green is more contracted than for blue. Central acuity of vision normal.

Gradenigo is astonished at the smallness of the dose of quinine and considers this a true case of idiosyncrasy. He has seen similar cases, but they were all due to large doses of quinine.

Bono thought the visual fields rather denoted a hysteric amaurosis.

Peschel explained that the ophthalmoscopic picture positively excluded the idea of a hysteric amaurosis, and says his case is

perfectly typical and identical with others previously described.

Angelucci says the visual fields in the case do not point to a hysterical amaurosis because the field for blue would have to be the smallest. He reproached Peschel for not having examined the field for violet.

Rosimini recommended large protective spectacles of glass for the working glasses, which are exposed to superficial injuries to the cornea from foreign bodies. He further shows small glass shells, similar to glass eyes, which, following de Wecker, he inserts into the conjunctival sac after dissection in cases of symblepharon.

Devincentiis states that this method is very old, but has not stood the test of time.

Gradenigo even thinks that the irritation from such a foreign body would cause the formation of symblepharon.

Rosimini recommends to brush the trachomatous conjunctiva with sublimate solutions and says this acts like a charm.

Bono has seen little good from sublimate and prefers nitrate of silver and sulphate of copper.

Devincentiis and *Angelucci* have seen good results from brushing sublimate (1 in 400) on the conjunctiva in cases of acute trachoma and in pannus; but none in old organized granulations.

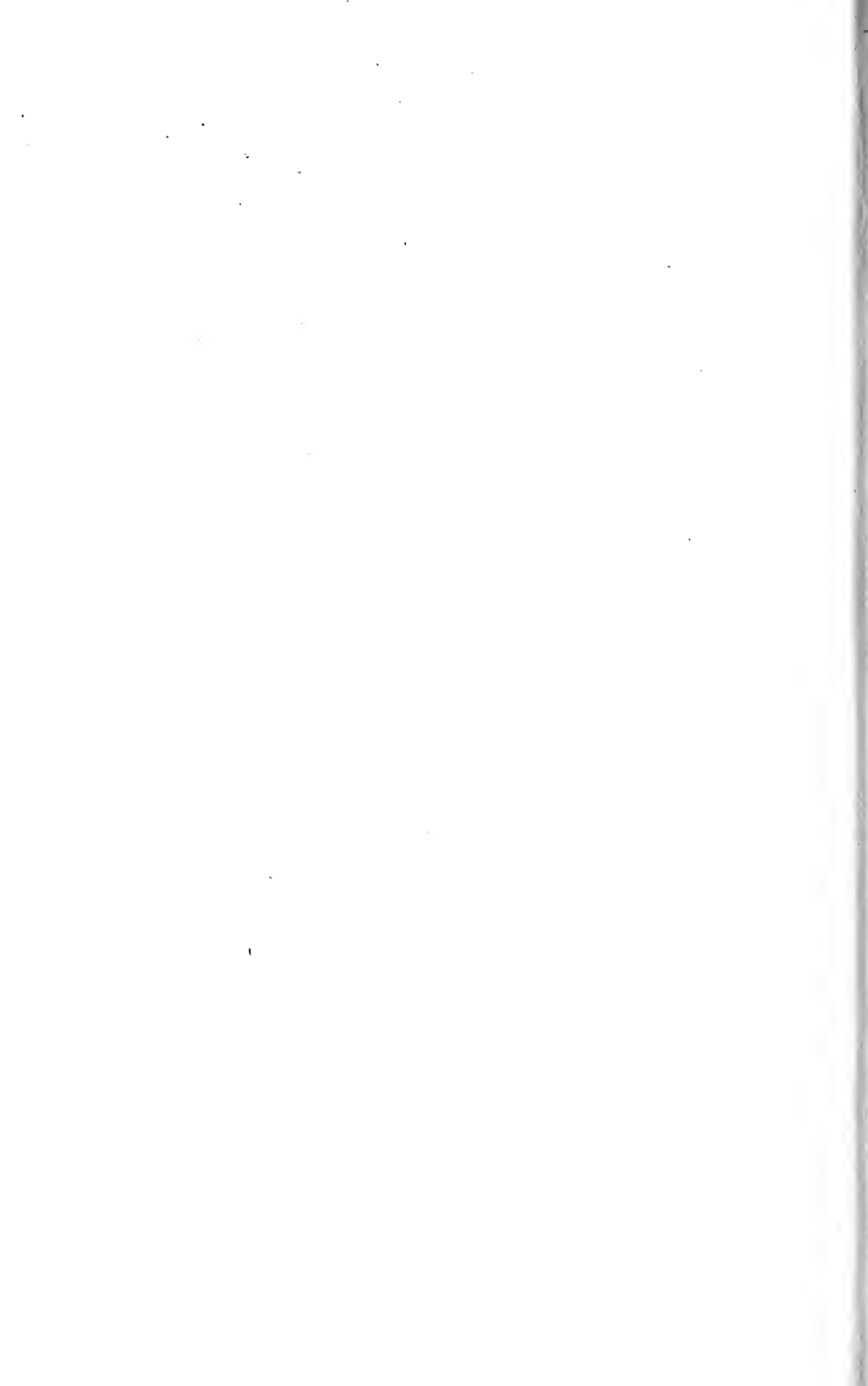
Secondi recommends the artificial ripening of cataracts according to Foerster's method, which has always given him good results. During the last year he has matured 18 cases in this manner, one of them was a case of posterior polar cataract with beginning cortical cataract and myopia. He has not tried to ripen zonular cataracts. He extracts three or four weeks after.

Reymond has once tried Foerster's method in a case of zonular cataract, but without success.

Tartuferi and *Balbiano* have found that when the muriate of cocaine is dissolved in a solution of bichloride of mercury (1 in 5,000) a double salt is precipitated which is but little soluble in water. This salt, according to their numerous experiments with threads infected with micro-organisms, has but little antiseptic value, its anæsthetic action is very small and it irritates the conjunctiva.

Gradenigo shows and recommends his electric spectacles, which serve to constantly apply the galvanic current. The dry battery is carried in a case in the pocket, the conducting wires appear like the common cords attached to the eye-glasses.

Devincentiis removed a large cyst from the sclerotic, which reached to the lower margin of the cornea. Histologically, he found it lined with pavement epithelium in some, in other places with mixed epithelium. It seemed to have been caused by a burn.



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1 American journal of ophthal-
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